LONG BEACH WATER DEPARTMENT

Leader in Environmental Stewardship and Water Conservation

2010 Urban Water Management Plan

Long Beach Board of Water Commissioners

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Acronyms

- 2010 UWMP: LBWD's 2010 Urban Water Management Plan
- Act: Urban Water Management Planning Act
- AF/Year: Acre-feet of water per year
- BMPs: CUWCC's Best Management Practices (BMP) for urban water conservation
- Board: City of Long Beach Board of Water Commissioners
- CII: Commercial, industrial and institutional water-use sectors
- CUWCC: California Urban Water Conservation Council
- CWC: California Water Code
- DOF: California's Department of Finance
- DWR: California's Department of Water Resources
- GPCD: gallons per capita per day
- LADWP: Los Angles Department of Water and Power
- LBWD: Long Beach Water Department
- M&I: Municipal and Industrial water use, this includes all normal uses of water other than interruptible supplies such as for groundwater replenishment and agriculture.
- MWDSC: Metropolitan Water District of Southern California
- SBx7-7: California's Water Conservation Act of 2009, also known as the "20 x 2020" legislation
- SCAG: Southern California Association of Governments
- UWMP Guidebook: DWR's "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan"
- WRDSC: Water Replenishment District of Southern California

Executive Summary

For the last 100 years the Long Beach Water Department (LBWD) provided an uninterrupted supply of high-quality water to the City's residents and business community. LBWD accomplished this through effective long-term planning, sound strategic investments and other economically efficient and environmentally responsible means.

As LBWD proudly celebrates its Centennial anniversary in 2011, the department's employees, under the guidance of the City of Long Beach Board of Water Commissioners (Board), remain committed to another 100 years of excellent water and sewer services that consistently exceed customer expectations.

This 2010 Urban Water Management Plan (2010 UWMP) articulates how the City's need for a reliable water supply will be met through 2035. The 2010 UWMP is required by California's Urban Water Management Planning Act (Act). The Act requires urban water suppliers to describe and evaluate, every five years, sources of water supply, demand management measures (conservation programs), implementation strategies and schedules, and other related information.

In compliance with the Act, the Board adopted Urban Water Management Plans in 1985, 1990, 1995, 2000 and 2005, and filed those plans with California's Department of Water Resources (DWR).

LBWD met the challenges of reliability, affordability and environmental stewardship in several ways.

- Expanded use of recycled water: For example, LBWD expanded its recycled water distribution system to include most of the sites in the City using large amounts of water for landscape irrigation (such as parks and golf courses) use recycled water. LBWD now serves about 6,500 acre-feet1 of recycled water to its customers each year; an amount roughly equal to 12% of the City's potable water demand.
- Comprehensive water conservation programs: LBWD has maintained a well-rounded water conservation program since at least the 1990's. Beginning in 2005 LBWD became more proactive, making certain

[1] An acre-foot of water equals the amount of water needed to cover one acre of land with one foot of water; which equals about 43,560 cubic feet or 325,851 gallons; this is about as much water as will be consumed per year at 3 Long Beach single-family homes.

wasteful uses of water illegal in the City. Today about 34% of the City's potable water demand is met through conservation2.

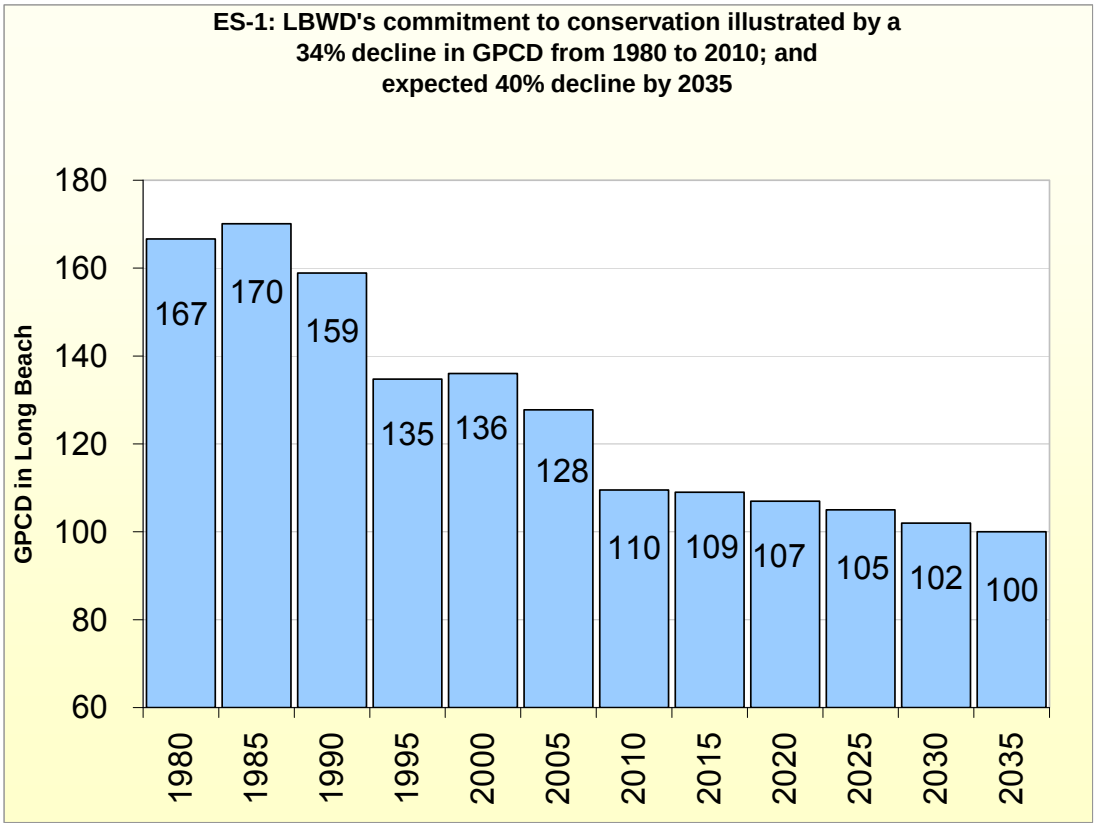
- Greater reliance on local groundwater supplies: LBWD had annual pumping rights of less than 27,000 acre-feet of water in the 1960's; today it has over 32,000 acre-feet of rights and by 2035 LBWD is anticipating rights to 35,000 acre-feet per year through future leases and purchases of existing rights.

Fortunately the City of Long Beach has taken many concrete actions that augment LBWD's own work towards its long-term goal of increased water-use efficiency and conservation. For example:

- City Council adopted a landscape ordinance (Ordinance No. ORD-10-0031) on October 12, 2010, implementing the requirements of the State's Model Landscape Ordinance. The City's ordinance requires new landscapes to include drought-tolerant plants, efficient irrigation systems, and other important measures.
- City Council adopted the Long Beach Sustainable City Action Plan on February 2, 2010, a long-term planning document that includes, among other elements, a goal of per capita water use reduction of 20% by 2020.
- City created an Office of Sustainability; this office pursues many factors related to a city's sustainability, including water conservation. Among other water-related activities, this office began distributing free mulch to the benefit of homeowners converting grass lawns to drought-tolerant landscapes, and the office promotes CAL Green Standards which encourage building conservation into new developments.
- The City, in partnership with LBWD,
  - Provides rain barrels for free to residents of Long Beach.
  - Is developing a grey water pilot program for residential properties.
  - May convert over 600,000 square feet of street medians from turf grass to beautiful drought-tolerant landscapes.

[2] Conservation as a percent of demand was calculated by assuming per capita demand, in the absence of conservation, would be today what it was in the 1980's; so conservation equals the difference between actual wet-water demand today and what it would have been had GPCD remained at 1980's level.

In response to severe drought and regulatory conditions over the last few years, water-use restrictions were imposed on the residents and business community of Long Beach in 2007. These restrictions along with extra-ordinary public outreach contributed to a dramatic reduction in the gallons per capita per day (GPCD) water use citywide, as shown in chart ES-1. Water use in Long Beach has steadily declined from 167 GPCD in 1980, to 159 in 1990, 136 in 2000 and 110 in 2010.



20 x 2020

California's Water Conservation Act of 2009 (SBx7-7) amended the Act by requiring, among other things, a reduction of California's retail potable GPCD of 20% by the year 2020. SBx7-7 allocates certain responsibilities to meet this state target to individual retail water agencies, requiring the agencies to use specified methodologies to calculate their baseline GPCD, year 2015 and 2020 GPCD targets and to declare which of the approved methods were used to calculate these targets. LBWD has fulfilled these requirements in this 2010 UWMP.

LBWD's 10-year baseline is 134 GPCD, interim urban water use target (year 2015) is 121 GPCD and urban water use target (year 2020) is 107 GPCD. LBWD established these water use targets using Method 1: the 20% reduction in GPCD from the 10-year baseline.

LBWD SBx7-7 Compliance as a Single Agency:

- Baseline: 134 GPCD
- Interim urban water use target: 121 GPCD
- Urban water use target: 109 GPCD
- Compliance Method: #1, 20% reduction from baseline

LBWD SBx7-7 Compliance as a member of the Gateway Region*:

- Baseline: 115 GPCD
- Interim urban water use target: 112 GPCD
- Urban water use target: 109 GPCD
- Compliance Method: Section 10608.22 "5% test"

** Values for regional compliance may be amended.*

LBWD intends to participate in a regional compliance program as well as complying on an individual agency basis. The Gateway Cities Region will likely include the cities of Downey, Huntington Park, Lakewood, Long Beach, Lynwood, Norwalk, Paramount, Pico Rivera, Santa Fe Springs, Signal Hill, South Gate, Vernon and Whittier, plus the Pico Water Authority. This regional alliance had not, as of the adoption of this UWMP, formally adopted a baseline, 2015 interim urban water use target, 2020 water use target or a compliance methodology. Therefore, the regional targets and methodology stated in this 2010 UWMP may be amended after the regional has formally adopted the necessary standards and requirements. If the region uses compliance method #3 (hydrologic region), its urban water use target would be greater than if it used the compliance method articulated in SBx7-7 section 10608.22, a test to ensure at least a 5% reduction in GPCD; therefore, the baseline and targets resulting from the 5% test are expected to be adopted by the region.

Demographic Factors

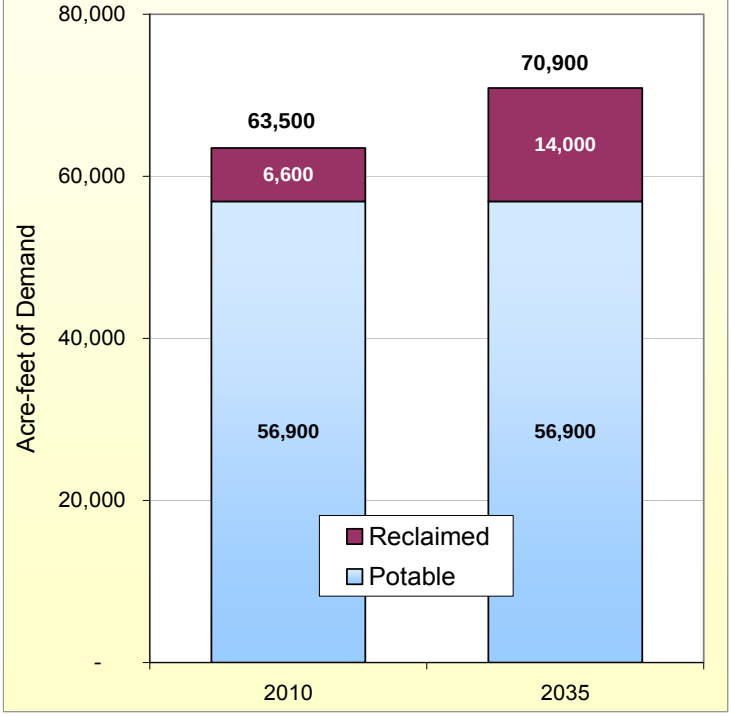
Several demographic factors will influence the City's demand for water, including population growth, housing density, employment and household income. This 2010 UWMP assumes population growth will be approximately 0.38%; or about 46,000 people over the 25-year period. It assumes single family housing will increase about 0.36% per year and multi-family units increase 0.78% per year. Employment is expected to increase just 0.4% per year and incomes by 0.9% per year, adjusted for inflation.

As a result of cost-effective conservation programs and expanded use of recycled water, this 2010 UWMP anticipated total potable demand to remain essentially flat over the next 25 years, as illustrated chart ES-2. Recycled water is expected to increase about 112% over the same period.

Supply Reliability

LBWD will meet most of the City's future demand for water with reliable, cost effective and environmentally responsible groundwater, recycled water and conservation. The groundwater is very reliable because water extractions from the groundwater basin are strictly limited, impermeable layers of clay protect the groundwater from surface contamination and a mandatory annual assessment on groundwater extractions provides the revenue necessary for an adequate level of replenishment.

ES-2: Potable demand is expected to remain flat even as population increases; while recycled water use doubles.



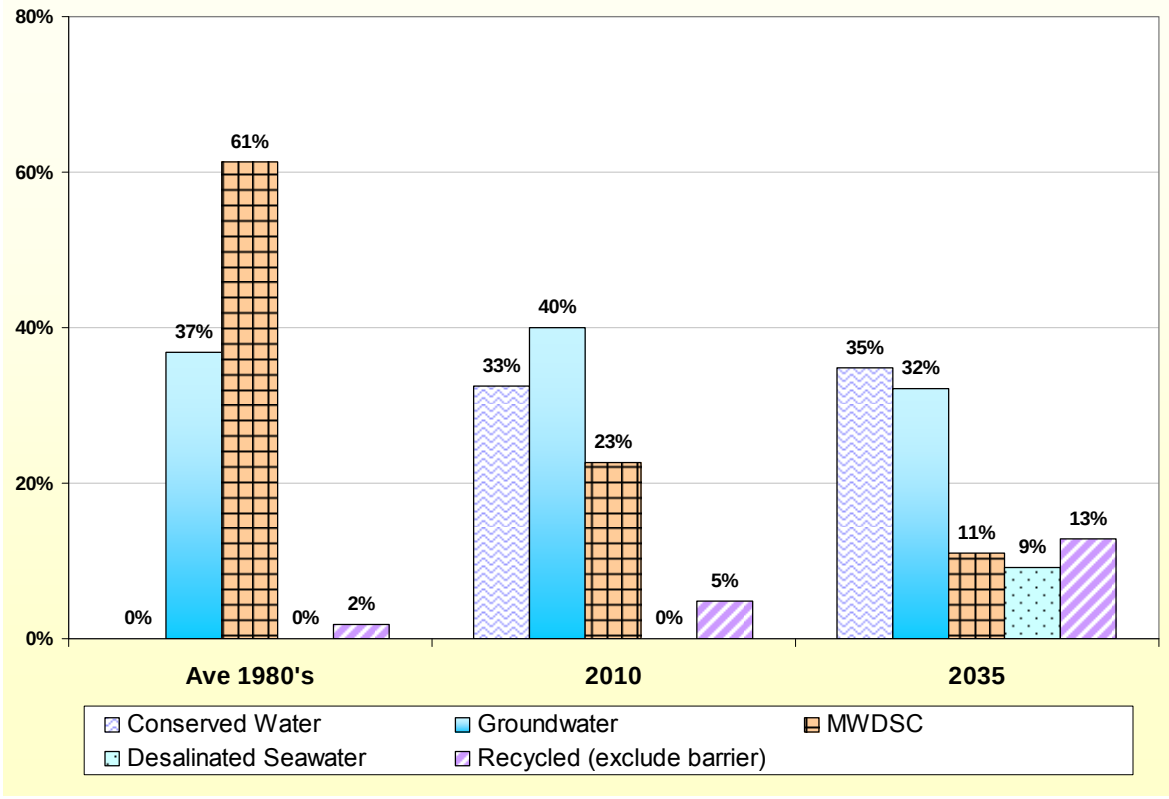
Recycled water is also very reliable, given that neither adverse hydrologic conditions nor other factors such as growth in other parts of southern California significantly affect the availability of recycled water to LBWD. Economically, the operating cost of recycled water is very low. Although the capital cost of installing new recycled water mains is very expensive, in the past LBWD has been able to offset these costs with state and federal funding.

The conservation that LBWD expects to realize by 2035 will also be reliable and cost effective. These conservation projects may include, among other things, the continuation of turf replacement programs, the installation of "smart meters" and a new billing system that allows for individualized budget-based rates.

The imported drinking water purchased wholesale by LBWD from the Metropolitan Water District of Southern California (MWDSC) will remain an important yet increasingly expensive water supply. MWDSC anticipates the long-term reliability of its supplies to be fairly high. Additionally, LBWD has a preferential right to MWDSC supplies in excess of LBWD's typical annual demand for the water and MWDSC's current shortage allocation plan guarantees that a member agency's retail water

supply will not drop below 100 GPCD (which is a very meaningful guarantee to LBWD since its demand is very near 100 GPCD).

Chart E-3 LBWD's Supply Portfolio Diversifies



Using the 1980's as a benchmark (no conservation), conservation in 2010 met 33% of LBWD's water demand, increasing to 35% by 2035; imported drinking water has been reduced from 61%, to 23% to 11% from the 1980's, to 2010 and 2035, respectively.

Public Involvement Process

The Act requires a public involvement process in the development of the 2010 UWMP. As shown on Table 1, LBWD provided a draft of its 2010 UWMP to the City's elected officials as well as the City Manager, City Advanced Planner, City Librarian and City Clerk, and solicited their input.

LBWD developed the 2010 UWMP in concert with other water agencies including its wholesale water supplier, MWDSC. Eight cities in the greater Long Beach area and the county of Los Angeles were invited to participate in the development of this 2010 UWMP and were provided with draft copies for their review and comments. Several community organizations were also provided with copies of the draft and invited to submit comments.

On February 3, 2011, the Board conducted a publically-noticed Study Session on the draft to receive public input prior to the adoption of the 2010 UWMP *(California Water Code (CWC) § 10642)*. A second Public Hearing will have been held on June 2, 2011 for review of the final 2010 UWMP, and upon closing the Public Hearing, the Board of Water Commissioners will have been asked to adopt the 2010 UWMP *(CWC § 10642).*

As shown in this 2010 UWMP, LBWD positions itself to continue its stellar record of reliability, quality, cost effectiveness and environmental stewardship well into the first half of the 21st Century.

Long Beach Water Department

LBWD was established July 1, 1911, by the City Charter to regulate and control the use, sale and distribution of water owned or controlled by the City of Long Beach. On June 27, 1911, the voters approved the issuance of an $850,000.00 bond to purchase the two water companies serving the City at that time. On July 1, 1911, the City's Municipal Water Department began operations.

At a special election on February 17, 1931, the voters of Long Beach approved the City's membership in MWDSC, establishing Long Beach as one of the original 13 cities in what is now the largest urban water agency in the U.S. MWDSC provides about half of all potable water consumed in the southern California coastal plain – serving approximately 19 million people from Ventura county in the north to the Mexican border in the south.

At the same election in 1931, the voters also approved a City Charter amendment creating the Board. The Board is comprised of five members of the Long Beach community, each serving up to two 5-year terms. Members of the commission are nominated by the Mayor and approved by the City Council.

The City Charter entrusts the Board with significant responsibility and authority. The Board is charged with full jurisdiction over all water works necessary to the acquisition, treatment, sale, and distribution of water served to the City and the City's sanitary sewer system. Among other duties, the Board has authority to acquire or sell real property, to construct and operate water facilities, to purchase equipment and to make contracts. Additionally, the Board is responsible for establishing LBWD's missions and goals, and adopting policies and strategies to meet those ends.

The Board-adopted mission of LBWD incorporates the potable water, recycled water and sanitary sewer systems operations and maintenance, and embraces customer-centered, efficient, and environmentally sensitive operations:

- to deliver an uninterrupted supply of quality water to our customers;
- to effectively dispose of or reclaim sanitary sewage; and
- to operate in an economically efficient and environmentally responsible manner.

The Board adopted a set of 'Values' to support the mission:

- a proactive mindset, anticipation of future needs;
- effective communication within LBWD and the community at large;
- enthusiastic support of water education programs; and

- responsible support of water conservation activities.

For more information on LBWD, please visit our web site at www.lbwater.org; for more information on the City of Long Beach, please visit www.longbeach.gov.

Section 1. Plan Preparation

LBWD is an urban water supplier as defined by Water Code section 10617, averaging approximately 67,000 acre-feet (or roughly 21.8 billion gallons) per year over the last five years, of potable and recycled water to roughly 90,000 accounts that serve nearly 463,000 people. Therefore, the Board is required to adopt an Urban Water Management Plan by July 1, 2011.

This 2010 UWMP was developed using DWR's "Guidebook to Assist Urban Water Suppliers to Prepare a 2010 Urban Water Management Plan" (UWMP Guidebook); the following discussions, section references and referenced tables reflect this approach. The tables referenced in this document are contained in Attachment B.

1.1 Coordination with Appropriate Agencies *(CWC § 10620(d)(2))*

Table 1 - Coordination with Appropriate Agencies This table, in Attachment B, shows the level of coordination between LBWD and other agencies. LBWD primarily serves the City of Long Beach. As shown in Table 1, extremely small portions of other communities are also served.

Public Hearing and Notification *(CWC § 10621(b).* LBWD was required to notify cities and counties in its service area of the opportunity to submit comments regarding the Plan during the update process. As shown in Table 1, these entities were notified and their comments solicited at least 60 days prior to the public hearing on the plan. Ninety-nine percent of LBWD's accounts are located in City of Long Beach; the balance located in an unincorporated area within the county of Los Angeles and seven other cities. Table 1 also indicates the groups and organizations other than local cities that were notified of the availability of the draft plan *(CWC § 10642).*

Approximately 40% of the drinking water served by LBWD is purchased wholesale from MWDSC. As required by law, MWDSC adopted a Regional UWMP, a plan developed with input from water agency customers of MWDSC. MWDSC was notified of the development of the 2010 UWMP and encouraged to participate and comment.

UWMP preparation *(CWC § 10620 (e))* this 2010 UWMP was prepared by LBWD staff.

1.2 Plan Adoption, Submittal, and Implementation *(CWC § 10643)*

A copy of the Board's resolution adopting this 2010 UWMP is attached.

The adopted 2010 UWMP shall be submitted to DWR, the California State Library, and made available to the public through posting on LBWD's website at www.lbwater.org within 30 days after adoption by the Board *(CWC § 10644(a))*, 10645). The UWMP will be made available to all cities and counties to which LBWD provides water supplies no later than 60 days after the submission of the Plan *(CWC § 10635(b*)).

LBWD will periodically review and adopt any changes or amendments to the 2010 UWMP in accordance with the procedure set forth in California Water Code 10640 through 10645.

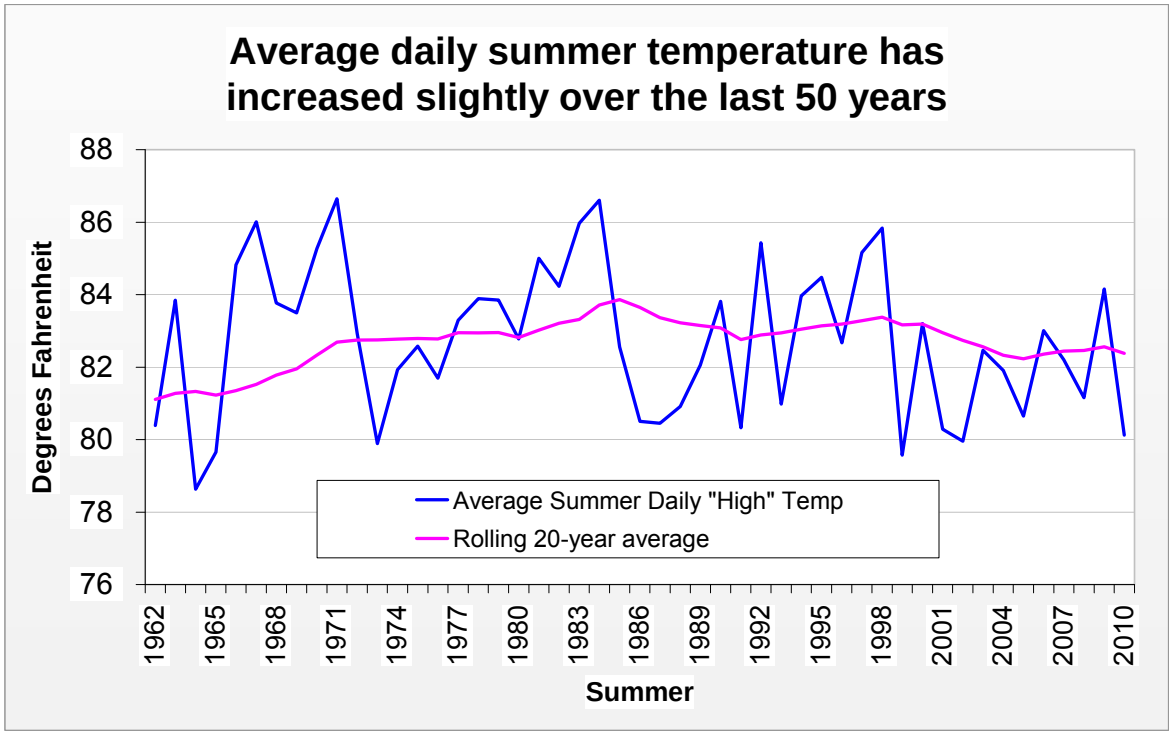
Section 2. Description of Service Area

2.1 Physical Description *(CWC § 10631(a))*

The City of Long Beach incorporates about 52 square miles along California's coastline in the southwest corner of the County of Los Angeles. Long Beach is one of California's charter cities and was incorporated more than 120 years ago. LBWD services the City almost exclusively, providing an uninterrupted supply of quality water through economically efficient and environmentally responsible means to the City's nearly half-million residents and the business community. Over 900 miles of water mains and 750 miles of sanitary sewer lines are maintained within LBWD's service area.

2.2 Climate *(CWC § 10631(a))*

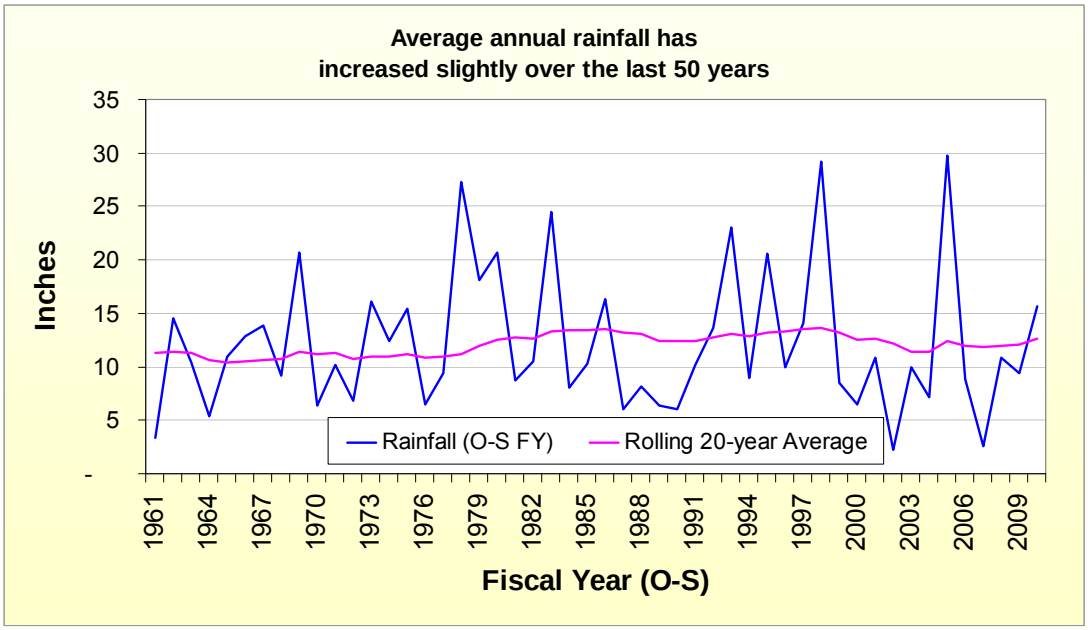
Weather impacts how much water people use, especially how much water is needed for landscape irrigation. The primary weather impacts are summer temperatures and



winter rainfall. The average maximum daily summer (months of July-Sept) temperature has increased a little over one degree Fahrenheit (^{o}F) over the last 50

years, gauging from a 20-year rolling average; rising from about 81° F to almost 84° F, then dropping back down to slightly over 82° F. As shown by the above chart, average summer temperatures can fluctuate dramatically from year-to-year.

Rainfall in Long Beach also fluctuates dramatically from year-to-year. The total rainfall can fluctuate from a low of 2.6 inches (2002) to a high of about 38 inches (2004-05). However, on a rolling 20-year average, as shown in the following chart, the amount of rainfall is fairly constant.



Rain, when it falls in Long Beach, impacts demand on LBWD but not supply. Demand for water decreases as rainfall increases, offsetting the need for landscape irrigation. This rainfall does not add to the supply of water because impermeable layers of clay and silt prevent the water from percolating into the water-bearing soils of the groundwater aquifers. The aquifers below Long Beach are replenished from percolation basins in the Whittier Narrows area along the San Gabriel River. This percolated water does not affect the supply to Long Beach over the short term because the percolated water takes many decades to travel from the spreading grounds to Long Beach and because the groundwater basin holds an amount of water greatly in excess of the annual allowable extractions.

The groundwater basin is fed, in part, by precipitation in the San Gabriel Mountains. For the reasons stated above, an annual fluctuation in precipitation is much less important than changes in long-term average rainfall. As the chart above illustrates, there has been very little change in the long-term average rainfall.

It is important to note that this precipitation is only one of three sources of water percolated into the groundwater basin; the other two are MWDSC wet-year replenishment supplies and treated recycled water. The effects of climate on MWDSC's supplies are in MWDSC's Regional UWMP.

2.3 Population *(CWC § 10631(a))*

Table 2 - Population: Current and Projected This table forecasts the City's population from 2010 through 2035.

The 2010 U.S. Census indicates the population of Long Beach remained fairly level over the ten years ending in 2010, with an average annual growth rate of just 0.016%. This is a sharp departure from growth during the 1990's throughout southern California.

Southern California Association of Governments (SCAG) and MWDSC project future average annual population growth will be somewhat higher, at 0.52% per year. These estimates were developed prior to the release of the 2010 U.S. Census.

Making the assumption that the economy will rebound at some point over the next twenty-five years, this 2010 UWMP assumes population growth will be between these two extremes, projecting an average annual population growth of 0.38%. This 2010 UWMP uses the population estimates from the 2010 U.S. Census Bureau for its 2010 population.

2.4 Other Demographic Factors Influencing Water Demand *(CWC § 10631(a))*

The demand projections for Long Beach were first developed by MWDSC, using input from LBWD and SCAG. MWDSC used this data as input into it econometric demand-projection model. The model takes many factors into consideration including expected changes in housing, employment and income.

HOUSING

Per capita water use in single family housing is higher than in multi-family units, in large part because single family unit's greater use of water outdoors and more people per dwelling unit.

MWDSC estimates the number of single family units to increase from today's 78,974 to 86,267 (0.35% per year) by 2035; while multi-family units increase from 90,954 to 108,773 (0.72% per year) over the same period; for a total increase of 25,112 housing units over the 25-years, representing an annual increase of 0.55%. Single family units as a percent of total housing was about 46% in 2010, slightly decreasing to about 44% by 2035; with multi-family increasing from 54% to roughly 56% of total housing over

the same period. This higher rate of growth in multi-family housing units is to be expected in an urbanized, built-out city such as Long Beach and foretells of higher density. Although MWDSC's projections of the number of new housing units are probably overstated, they have been used in this 2010 UWMP, erring on the side of overestimating water demand.

The number of people per household is about 70% greater in single family households (3.49) in 2010 than in multi-family (2.05), but declines to just about 58% greater by 2035 (3.28 and 2.07 people per household, respectively). But housing density is much greater for multi-family: about 27 units per acre and 6 units, respectively for multi-family and single family.

In summary, per capita water use in residential settings will not change significantly as a result of changes in the housing sector (although the per capita water use will continue to decrease as a result of LBWD's conservation programs).

EMPLOYMENT

Water use increases as employment increases, consuming water on the job for personal use and in the process of performing their duties. The estimated increase in jobs is 16,343 over the 25-year period; from 179,842 jobs to 196,185 in 2010 and 2035, respectively. This represents an increase of just 0.4% per year, which is roughly the same as the overall population growth.

In summary, low employment-growth estimates for Long Beach point towards slow growth in demand for water within the commercial, industrial and institutional sector (CII).

INCOME

Water use and household incomes tend to rise and fall together. As a household's disposable income increases it will have fewer financial concerns about over-using water and will be more likely to purchase water-consuming devices such as a Jacuzzi or swimming pool. Rising household incomes, then, put upward pressure on the demand for water.

MWDSC's 2010 Regional UWMP projects incomes in Long Beach to increase over the twenty-five period from about $47,927 to $52,915 (both numbers are in year 2010 dollars); or about 0.40% per year.

In summary, the slight increase in income will have an upward, but negligible influence on demand for water.

RESTRICTIONS

In response to the recent multi-year drought and regulatory restrictions in water supplies, LBWD implemented very successful water-use restrictions. The complete Water Shortage Plan, Resolution No. WD-1266, is included in the 2010 UWMP as Attachment F. Based in part on the response by LBWD's customers to these restrictions, water use in Long Beach declined from 130 GPCD in 2005 to just 110 GPCD in 2010. Other factors pushing down GPCD was LBWD's extensive public education campaign and, very likely, the severe economic downturn known as the Great Recession.

In summary, significant upward pressure on GPCD will likely occur as the drought ends, regulatory mandates lessen or are better managed, and the economy begins to recover.

Section 3. Water Demand

3.1 Current and Projected Water Demand

Comparing past, current and projected water use by sector is one way to analyze patterns and improve the accuracy of demand projections. While projecting future demand by using General Plan land-use zoning designations and projected build out by water-use sector may provide accurate demand projections, that type of information is not available from the City of Long Beach.

LBWD billing and customer information is managed through the City of Long Beach utility billing department, a department which bills and collects customer information for a number of services provided by the City, such as refuse and natural gas services. For data on past and current water use, this 2010 UWMP provides a level of information limited by that collected and made available by the City's utility billing system.

Future water use projections were based on estimates developed in cooperation with MWDSC (which used input from LBWD and SCAG and fed that information into MWDSC's econometric model), LBWD's expectations for additional water conservation and the SBx7-7 urban water use target for LBWD.

Description of Tables Related to this Subsection

Tables 3 through 7: Past, Current and Projected Water Deliveries *(CWC § 10631(e)(1))* These tables show estimates of water use and the number of accounts by customer type. Water use in Long Beach is metered, therefore the values in Tables 3 through 7 related to unmetered accounts are zero. These tables include demand for single family units, multi-family units, commercial and industrial, and for landscape irrigation. LBWD has no agricultural accounts. Recycled water demands are not included in Tables 3 through 7 but are shown beginning with Table 10. The total water demand estimates are based on those in Table 11, which are the total water use based on our 20 x 2020 urban water use targets, which are discussed in detail below. These numbers also closely align with those developed by MWDSC econometric model. The total, because it is a product of the very comprehensive and complex econometric model, is the important number. The numbers in Tables 3 through 7 are estimates of how those totals might be allocated among the different customer classes based on the same proportion of water use as in 2007 and 2008.

Over the past five years LBWD has taken extensive conservation measures which have helped to substantially reduce our GPCD from 129.4 in 2005 to 109.5 as of 2010. Tables 3 and 4 document the 15% water use reduction during that time period. (Please note: these tables are not the same as total water into LBWD's system; for

example, these tables do not include water lost as a result of water main breaks). LBWD has already surpassed its 2015 urban water use target of 121 GPCD.

The demand estimates shown in Tables 3 through 7 do not include the imported MWDSC potable water delivered to the Alamitos Seawater Barrier. The barrier prevents seawater from migrating underground into the Central Basin Aquifer, a migration that would spoil the fresh water stored in the aquifer. By injecting potable or highly treated recycled water into the ground near the coastline, a pressure "barrier" is formed blocking the seawater's migration. That potable barrier water is delivered by MWDSC through a member agency metered connection, directly into the facilities used for barrier injection. For fifty years or so the member agency whose name was assigned to the MWDSC connection was the Central Basin Municipal Water District. Between 2000 and 2005, the connection was transferred to LBWD. So although the connection has been assigned to LBWD, none of the water enters LBWD's distribution system and LBWD had no control over when or how that water is used (as LBWD does not manage the seawater barrier injection operation). About one-third of the seawater barrier's potable demand was replaced with recycled water beginning in 2006; that number is expect to increase to 50% by 2015.

Table 8: Low Income Project Water Demands *(CWC § 10631.1(a))*

Projecting future demand by low income land-use zoning designations and projected build out by water use sector may provide accurate demand projections. However, that type of information is not available within the City of Long Beach General Plan. Twenty-eight percent of Long Beach residents are classified in the General Plan as being low income residents, and that percentage has been used here for future forecasts.

Table 9: Sales to Other Water Agencies LBWD has not had and expect no water sales to other retail water agencies.

Table 10: Additional Water Uses and Losses (AF/Year)

Shown in Table 10 are recycled water usage, the sales of barrier water to WRDSC and an estimate of the system losses. Not shown in Table 10 is conjunctive use. In the recent past LBWD, working with MWDSC and WRDSC, and with funding from DWR, created and filled a 13,000 acre-foot conjunctive use storage project in the Central Basin Aquifer. The water stored belongs to MWDSC; it was put into storage through in-lieu means in cooperation with LBWD. LBWD extracts MWDSC water when MWDSC calls the water as a source of firm sales to LBWD; at the same time MWDSC reduces by an equal amount direct deliveries through its pipeline to LBWD. Because the water is treated as a normal MWDSC purchase when extracted, it is not accounted for in Table 10.

Table 11: Total Water Use (AF/Year)

Total Water Use is the total actual and estimated water demands for LBWD, including M&I[3], barrier, unaccounted for water (such as water lost from main breaks and for fire suppression) and recycled water.

Table 12 - Retail agency demand projections provided to wholesale suppliers.

Shown in Table 12 are LBWD demand projections on its wholesale water agency, MWDSC. This information has been communicated to and developed in concert with MWDSC. *(CWC § 10631(k))*

3.2 Baseline GPCD and Urban Water Use Target *(CWC § 10608.20(e))*

LBWD's 10-year baseline is 134 GPCD, interim urban water use target (year 2015) is 121 GPCD and urban water use target (year 2020) is 107 GPCD. Please see the attached GPCD compliance spreadsheet for details. Under SBx7-7, LBWD could have set its urban water use target at 125 GPCD by using Method 3 (hydrologic regions), a method that allows most water agencies near the southern California coast to conserve little to no water. However, doing so would have violated the spirit and purpose of SBx7-7 and would have contributed to the growing unreliability of southern California's potable water supply, by failing to achieve a level of conservation that is both reasonable and necessary.

LBWD established its urban water use target (year 2020 target GPCD) and its interim water use target (year 2015 target GPCD) based on Method 1: the 20% reduction in GPCD from a baseline. The following is a discussion of the baseline and those targets.

LBWD has used the "GPCD Method" for compliance with the California Urban Water Conservation Council's (CUWCC) Best Management Practices (BMP) for urban water conservation. The CUWCC has created a spreadsheet for calculating GPCD compliance with both the BMPs and with SBx7-7. LBWD has used this spreadsheet and incorporates the spreadsheet into this 2010 UWMP by reference. Monthly data for the baseline period is necessary in order to weather-normalize the 2015 GPCD and 2020 GPCD data when those years' data are reported. For that reason, the referenced spreadsheet includes monthly data. *(CWC § 10608.40)*

SBx7-7 allows a water agency to exclude from its GPCD calculation certain indirect potable reuse water supplies entering its distribution system. Indirect potable reuse is a significant source of groundwater recharge in the Central Basin Aquifer. LBWD has chosen not to take advantage of this exclusion at this time, but reserves the right to exercise that option in the future.

[3] M&I: Municipal and Industrial water use (this includes all normal uses of water other than interruptible supplies such as for groundwater replenishment and agriculture)

The 10-year baseline period used by LBWD is 1996 through 2005, inclusive. SBx7-7 allows a water agency to extend its baseline period up to five years further into the past (creating a 15-year baseline) if the agency has met certain recycled water-use thresholds. LBWD meets those thresholds but has chosen not to take advantage of this benefit at this time, but reserves the right to exercise that option in the future. SBx7-7 allows a water agency to exclude from its GPCD calculation certain industrial process water. LBWD has chosen not to take advantage of this exclusion at this time, but reserves the right to exercise that option in the future.

SBx7-7 sets a maximum allowable urban water use target (year 2020 GPCD) equal to 95% of a 5-year baseline. If the method chosen by a water agency resulted in an urban water use target greater than this amount, then the agency would have to use the 95% of 5-year baseline target. When applied to LBWD, this maximum allowable urban water use target is 125 GPCD, an amount greater than the 107 GPCD resulting from implementing Method 1; therefore, the target established by using Method 1 takes precedence.

As mentioned, LBWD used the CUWCC spreadsheet and Method 1 in order to calculate its interim water use target (2015) and its urban water use target (year 2020). The following is a discussion of the inputs into the calculation and the required public hearing. The references to methodologies, steps and page numbers are references to DWR's manual "Methodologies for Calculating Baseline and Compliance Urban Per Capita Water Use" (October 2010 version) created to help urban water agencies implement SBx7-7.

Methodology 1: Gross Water Use

Step 1: Define the 12-month calculation period

> The 12-month period July-to June is used. This is the "water year" for both the agency supplying our imported water as well as for the Watermaster of the groundwater basin providing our local source of water.

Step 2: Delineate Distribution System Boundary

> The distribution system boundary is the system downstream from MWDSC's imported finished-water meters and downstream from LBWD groundwater treatment plant.
>
> Per DWR's methodologies manual, the groundwater treatment plant was excluded from the distribution system. Water from the treatment plant into the distribution system is not directly metered but can be estimated because water from the groundwater wells to the treatment plan is metered; and water from the treatment plant to waste is also metered (water is 'wasted' as a result of the treatment process and the continuous process of testing water quality). Water

lost through evaporation at the treatment plant is insignificant (only about one acre-foot per year as determined through the water-loss estimate for the CUWCC BMPs in the four fiscal years 2005-2008).

Step 3: Compile Water Volume from Own Sources

LBWD has a number of groundwater wells. Each well is metered and the meter accuracy determined. The wells pump water to the groundwater treatment plant. For the purposes of SBx7-7, the wells are outside the distribution system, being upstream of the treatment plant. This SBx7-7 calculation requires an adjustment for source-meter inaccuracy. The volumes of water reported in the referenced spreadsheet are, as shown there, adjustments for meter inaccuracy.

Step 4: Compile Imported Water Volume

Imported water data comes from MWDSC meters; these are the same meters MWDSC uses to invoice LBWD for purchased water. All the water through these meters is treated potable water and enters LBWD's distribution system.

This SBx7-7 calculation requires an adjustment for source-meter inaccuracy. The volumes of water reported in the referenced spreadsheet are, as shown there, adjusted for meter inaccuracy.

Step 5: Compile Exported Water Volume

LBWD does not export potable water from its distribution system to any water utility.

Step 6: Calculate Net Change in Distribution System Storage

LBWD has steel water tanks in its distribution system. As noted, the volume of water in these tanks fluctuates on a daily basis (they exist for operational purposes, not long-term storage). The differences in storage from year-to-year, if any, is meaningless compared to the annual flows of water into the distribution system and any recorded differences would have as much to do with the time of day of the read. For example, if the difference from one year to the next equaled roughly half the total storage capacity, it would still only represent about 3/10th of 1% of the water into the distribution system. Because the storage level would have to be read at exactly the same time of day each year for the reads to have any meaning – but were not – and because any differences in storage would be insignificant compared to total water into the system, this analysis does not include changes in the distribution system storage.

> "If the change in distribution system storage is expected to be insignificant, or if data needed to calculate the change in distribution system storage are not available, the water supplier may forgo this step." (page 16)

Step 7: Calculate Gross Water Use Before Indirect Recycled Water Use Deductions

See the worksheet labeled "Main Data" within Attachment H.

Step 8 & 9: Deduct Recycled Water Used for Indirect Potable Reuse from Gross Water Use

LBWD did not take the indirect potable reuse credit, although it qualified for the credit. A portion of the groundwater pumped by LBWD and placed into its distribution system is indirect potable reuse. The water is pumped from the Central Basin groundwater aquifers. Managing the replenishment of the basin is the responsibility of WRDSC. As a part of its duties as the replenishment agency, WRDSC publishes an Engineering Survey and Report; this report maintains a historic record of how much recycled water is placed into storage and how much water is extracted from storage each year. This information provides the basis for the deduction of recycled water used for indirect potable reuse from Gross Water Use.

Loss Factor: A loss factor to account for water losses during recharge and extraction must be used. If a loss factor has been developed as part of a groundwater management plan, a basin adjudication process, or some similar regulatory process, the water supplier must use that loss factor and provide reference to the appropriate documentation. If a loss factor has not been developed as part of a local regulatory process, the water supplier must use a default loss factor of 10%. Because a loss factor has not been developed for the Central Basin, LBWD would use the 10% loss factor.

Step 10 (Optional): Deduct from Gross Water Use the Volume of Water Delivered for Agricultural Use

LBWD has no agricultural customers as defined. Therefore, there are no deductions for agricultural water use.

Step 11 (Optional): Deduct Volume of Water Delivered for Process Water Use

LBWD did not take the process water deduction. Water agencies may qualify for the deduction in several ways. We used CY 2009 water usage information to get an idea of whether LBWD would qualify in any of these ways.

A. If industrial use is greater than or equal to 12% of total use: Industrial use in CY 2009 was only 9% of total use.

B. If industrial use is at least 15 GPCD: industrial use in CY 2009 was only about 9.5 GPCD.

C. Non-industrial use was 120 GPCD or less: assuming industrial water use was, on average, 9% of all water usage during the 10-year baseline period, then non-industrial water use in Long Beach would average about 119.1 GPCD. Therefore, because this is very close to the 120 GPCD limit, actual industrial water usage for all 10 years would have to be calculated in order to test this means of qualifying for the deduction.

However, even if LBWD qualified under "C", above, meeting the requirements for documenting the quantity of process water used during the baseline period is prohibitively difficult:

§596.4. Quantification and Verification of Total industrial Process and Industrial Incidental Water…(a) The volume of process water use shall be verified and separated from incidental water use [for each year of the 10-year baseline period].

(1) To establish a baseline for determining process water use, urban retail water suppliers shall calculate the process water use over a minimum continuous ten year period ending no earlier than December 31, 2004, and no later than December 31, 2010.

(2) Verification of process water can be accomplished by metering, sub-metering or other means determined suitable and verifiable by the urban retail water supplier and reported in their Urban Water Management Plans and reviewed by the Department of Water Resources.

Methodology 2: Service Area Population

LBWD is a Category 1 Water Supplier because its service area is essentially the entire City of Long Beach; there has been no significant expansion or contraction of its service area boundaries.

"Category 1: Water suppliers whose actual distribution area overlaps substantially (≥ 95%) with city boundaries (may be a single city or a group of cities) during baseline and compliance years." (page 25)

LBWD relies on information from the California Department of Finance (DOF) and the U.S. Census Bureau estimates for the City of Long Beach, a reliance which is congruent with the method described in the manual:

"Data published by the California Department of Finance (DOF) or the U.S. Census Bureau must serve as the foundational building block for population estimates." (page 25)

> "Category 1 water suppliers may use population estimates from any of these federal, state, or local agencies, as long as they clearly cite their data source, use the same source for both the baseline and compliance years, and correct these estimates for privately supplied large customers that may exist in their actual distribution area (for development of these corrections, see Appendix A)" (page 26)

The Long Beach population estimates from 1990 through 2000 were based on the 1990 and 2000 census and assumed an average annual percent increase during the intervening years.

The Long Beach population estimates from 2001 through 2010 were based on the 2000 and 2010 census, and assumed an average annual percent increase during the intervening years.

LBWD intends to use DOF estimates on a going-forward basis.

3.3 Public Hearing

SBx7-7 *(CWC § 10608.26(a))* requires LBWD to hold a public hearing as part of the target-setting process:

> In complying with this part, an urban retail water supplier shall conduct at least one public hearing to accomplish all of the following:
>
> (1) Allow community input regarding the urban retail water supplier's implementation plan for complying with this part.
>
> (2) Consider the economic impacts of the urban retail water supplier's implementation plan for complying with this part.
>
> (3) Adopt a method, pursuant to subdivision (b) of Section 10608.20, for determining its urban water use target.

Implementation plan for complying with SBx7-7

Since the beginning of the baseline years (1996), Long Beach has achieved remarkable success reducing GPCD. The rate of GPCD reduction increased in the summer of 2007 when LBWD implemented a massive campaign of public education and imposed landscape irrigation and other water-use restrictions. Due to these and other actions by LBWD, the City reduced its water use to just 110 GPCD by 2009-10.

The existing GPCD (110) is very close to the Method 1 urban water use target (107 GPCD). However, water conservation experts expect GPCD to rise as the region emerges from the water shortage and economic recession. Therefore, the implementation challenge for LBWD is to maintain the conservation ethic of our

existing customers even as the water supply picture and the economy improve, and to ensure water usage of new growth is managed within those constraints

In order to maintain the conservation ethic of our existing customers, LBWD will, as it has in the past, provide a variety of conservation programs, including on-going public and school education, programs for indoor and outdoor use and programs for residential and non-residential customers. Achieving a reduction in water use for landscape irrigation will be a major element of this effort. The drive to reduce landscape irrigation will include public education and conversions of grass lawns to drought-tolerant landscapes and working with the City of Long Beach to reduce potable irrigation of street medians. LBWD may introduce automated meter reading into its service area; if implemented, this program would be expected to achieve additional water conservation gains. The third potential tool for achieving additional conservation would be utilizing a new billing system that allows for better communication with customers regarding their water use and makes budget-based rates possible.

In order to ensure that water usage of new growth is managed within the need to keep per capita water use low, LBWD anticipates water usage of new growth to be constrained by the City's compliance with the State's Model Landscape Ordinance requirements, the State's Green Building Codes as they pertain to water use, and additional water-use limitations on water-using devices such as clothes washers. Additionally, new growth's water usage will also benefit from most of LBWD's other actions described above for maintaining the conservation ethic of existing customers (such as education).

Economic Impacts of Implementation Plan

LBWD implementing its conservation plan may have little to no negative impact on LBWD's financial condition. LBWD has shown that it is able to manage the economic impacts of past water conservation both in terms of conservation program expenditures and reductions in revenue (which are partially offset by reductions in expenses) caused by lower water sales. Because LBWD's 2020 target is not much different than today's GPCD, LBWD expects no significant additional negative economic impacts from the realization of its implementation plan for complying with SBx7-7.

LBWD implementing its conservation plan will have a positive financial impact because conservation will result in fewer purchases of imported drinking water, LBWD's most expensive water supply. Additional economic benefits will accrue in the future as the cost of imported drinking water increases.

LBWD implementing its conservation plan will also have a positive financial impact within the City of Long Beach because as per capita water use decreases, water utility expenditures (i.e., how much imported drinking water will have to be purchased) are

minimized, resulting in lower water revenue required by the water utility from its rate payers; meaning these rate payers will be left with more disposable income which can be used to stimulate the local economy.

The increased water reliability resulting from LBWD implementing its conservation plan will provide an additional economic benefit. A water shortage may cost the southern California economy billions of dollars, from disrupted business activity to potential impact on future economic growth to potential impacts on property values. Implementing the conservation plan will increase the City's water reliability, given the amount of its groundwater supplies, its preferential rights to MWDSC's water supplies and MWDSC's water shortage allocation plan. Therefore, the additional reliability resulting from implementing the conservation plan will help mitigate the economic harm a regional shortage would otherwise have on the City.

Adoption of Method for determining urban water use target

The City of Long Beach Board of Water Commissioners is the governing body of LBWD. A noticed public hearing held at LBWD's Administration Building on February 3, 2011 allowed for community input regarding LBWD's implementation plan for complying with SBx7-7 and considered the economic impacts of the implementation plan and adopted Method One, pursuant to subdivision (b)(1) of Section 10608.20, as the method for determining LBWD's urban water use target, a water use target equal to 80% of LBWD's baseline per capita daily water use. At the above referenced meeting, the Board adopted Method 1 for determining LBWD's urban water use target.

Table 13 – Base period ranges This table provides the 2008 total water deliveries, including potable and recycled water supplies. Because 2008 recycled water is less than 10%, the first base period will be a continuous 10-year period. (Excluded from this calculation is the recycled water in the groundwater indirect reuse; if that water were included, LBWD could use the alternative baseline; as noted elsewhere, LBWD reserves the option of using that alternative baseline in the future.)

Table 14 – Base daily per capita water use – 10 to 15 year range This table indicates the population served and water supplied for each of the years within the 10-year range**.** (Excluded from this calculation is the recycled water in the groundwater indirect reuse; if that water were included, LBWD could use the alternative baseline; as noted elsewhere, LBWD reserves the option of using that alternative baseline in the future.)

Table 15 – Base daily per capita water use – 5 year range This table shows the population served and the water supplied for each of the years within the 5-year range ending in 2008.

3.4 Water Use Reduction Plan *(CWC § 10608.36)*

LBWD has a very effective water conservation program that will be carried forward and expanded. Conservation begins when the water is still in the water mains by keeping the whole water distribution system as leak-free as possible. LBWD has over 900 miles of water mains and keeping them absolutely leak-free at all times is impossible. However, LBWD has maintained very low "unaccounted for water" losses over the years, usually about one-half of the industry standard. LBWD maintains this highly effective water-main conservation program through a proactive strategy that includes, among other things, repairing all water mains and water meters and other equipment as soon as leaks are identified, driving the streets looking for evidence of leaks from its largest water mains, using sophisticated computer software to prioritize the replacement of its water mains and replacing millions of dollars worth of the highest priority mains each year. This water main replacement program has consistently been one of the most expensive capital investments undertaken by LBWD for approximately the last fifteen years.

Probably the most important conservation tool, in addition to maintaining the integrity of the water mains, is to bill each customer based on how much water they use; and for residential properties, to charge increasingly higher rates as they use greater amounts of water (known as increasing block rate structures). Some communities provide water without metering the use and/or bill all customers the same amount based on average customer water use; this practice is being phased out throughout California. LBWD promotes water conservation because it bills customers for the amount of water they actually use and, for residential customers, bills them using an increasing rate structure. LBWD, working with the City of Long Beach, is implementing a new, advanced billing system that will allow for even greater conservation incentives.

Single-family and multi-family customers together are responsible for approximately two-thirds of the City's demand for water. Several of LBWD programs promote conservation in residential settings, and several of these programs are expected to be expanded in the future. LBWD's financial billing system automatically checks whether a customer's water use has increased significantly from the past, and when a large increase is observed the customer is offered a free home water-use inspection. In another program, LBWD contacts the residential water customers with the highest water use and offers, again, the free home water-use inspection.

Because about half the water used at the average single-family home is for landscape irrigation, LBWD provides, at no cost to the customer, very well attended and received classroom instruction on the design, installation, and maintenance of California-friendly landscape. LBWD also reaches out to customers using the most water, offering free home water-use audits.

Another innovative program by LBWD is the direct installation by LBWD of weather-based irrigation controllers, a program under which LBWD identifies accounts using the most water then offering free water-use studies and free installation of weather-based irrigation controllers.

LBWD showcases a beautiful demonstration garden that highlights low water-using landscapes for residential properties, focusing on issues such as design principles, plant material, non-plant material, creating habitats, storm water capture, and other environmentally beneficial topics.

A recent addition to the landscape programs is LBWD's very popular Lawn-to-Garden incentive. Both residential and commercial customers are eligible for a generous rebate for removing their water-guzzling lawns and replacing them with a drought tolerant garden. LBWD expects to realize substantial residential water-use reductions through this ongoing program.

LBWD's water use reduction plan will continue to include the installation of, or rebates for, water conserving devices. California Water Code Section 375 provides the authority for these actions:

> **375**. (a) Notwithstanding any other provision of the law…, any public entity which supplies water at retail or wholesale for the benefit of…persons within the service area or area of jurisdiction of the public entity may, by ordinance or resolution adopted by a majority of the members of the governing body…after holding a public hearing upon notice…and making appropriate findings of necessity…for the adoption of a water conservation program, adopt and enforce a water conservation program to reduce the quantity of water used by … those persons for the purpose of conserving the water supplies of the public entity.
>
> (b) With regard to water delivered for other than agricultural uses, the ordinance or resolution may…specifically require the installation of water-saving devices which are designed to reduce water consumption. The ordinance or resolution may also encourage water conservation through rate structure design.
>
> (c) For the purposes of this section, "public entity" means a city, whether general law or chartered, county, city and county, special district, agency, authority, any other municipal public corporation or district, or any other political subdivision of the State.

In addition to spreading conservation to residential accounts and dedicated landscape accounts, LBWD works closely with its commercial, industrial, and institutional customers (CII) to help them conserve water. LBWD has encouraged conservation through targeted direct marketing, through rebates for water conserving devices, and

has consistently promoted conservation in the business community through advertisements and other promotional means.

LBWD actively promotes conservation through its work in the classrooms of the Long Beach Unified School District, the Miller Children's Hospital, and the Long Beach Aquarium of the Pacific. LBWD promotes conservation by supporting community functions and making presentations at local and regional events, including advertising inserts with utility bills, and purchasing advertising space in environmental publications and the newspaper of general local circulation.

LBWD encourages conservation through its leak-detection program, metered water program, its rate structure, its work with landscape irrigators and homeowners that use large quantities of water, its rebate programs, and water education programs. However, behind these incentives and education programs is LBWD's prohibition against certain uses of water. Adopted by the City of Long Beach Board of Water Commissioners are prohibitions against leaks in private plumbing systems, watering landscape beyond saturation, operating fountains or other water features that do not recirculate the water, allowing the hose to run while washing a car, and other prohibitions. These prohibitions are described in LBWD Water Conservation and Water Supply Shortage Plan, incorporated into this 2010 UWMP, and available from LBWD upon request.

Section 4. System Supplies

Water supply projections are shown on **Table 16 - Current and Planned Water Supplies (AF/Year)** *(CWC § 10631(b))*. The major sources of water are those purchased wholesale from MWDSC, groundwater pumped and treated by LBWD, recycled water and, possibly in the future, desalinated seawater.

4.1 Wholesale Purchases

Wholesale supplies are shown in Table 17**.** The imported drinking water purchased by LBWD will remain an important supply. LBWD purchases this water wholesale from MWDSC, an agency which is essentially a joint powers authority of the major water agencies in southern California.

4.2 Groundwater *(CWC § 10631(b))*

LBWD currently has the right to pump 32,692 acre-feet per year of groundwater from the Central Basin Aquifer and 0.7 acre-feet from the West Coast Basin. LBWD has no wells in the West Coast Basin and, therefore, does not pump those water rights. *(CWC § 10631(b)(2)).*

The Central Basin is a groundwater aquifer under 277 square miles in mostly urbanized southern Los Angeles County. The basin was seriously over-drafted by the mid-1900's. The basin was adjudicated in Superior Court in the early 1960's, strictly limiting extractions to apportioned rights, and apportioning the pumping rights to certain parties; this adjudication, therefore, provides the framework for groundwater management of this basin. A copy of the judgment *(CWC § 10631(b)(2)),* a 91-page document, is enclosed as an attachment and is also available on LBWD's web site at www.lbwater.org or more specifically, www.lbwater.org/pdf/CentralBasinJdgmnt.pdf

The judgment is monitored by the court-appointed Watermaster, a service of DWR. The Watermaster publishes a comprehensive annual report documenting many aspects of the basin, including

- The exact location of the basin, the amount of replenishment taking place and replenishment operations,
- The number of active and inactive wells,
- Water quality information,
- The sale and lease of water rights,
- How much water was extracted and by whom,
- The seawater barrier operations,

- 50 years of data tracking groundwater levels at key monitoring sites,
- Water imported into the Central Basin area for use by local water agencies,
- A complete history of the Watermaster services and
- The successful efforts to keep the Central Basin safe yield in tact *(CWC § 10631(b)(1))*.

A copy of the most current report available at the time of the development of this 2010 UWMP, the 103-page report for FY 2009-2010, is included as an attachment. Copies of this and previous annual reports are available from the Watermaster at: www.water.ca.gov/Watermaster/sd_reports/centralbasin.cfm

The annual pumping rights allocated in the judgment exceed the natural yield of the basin. Therefore, in addition to restricting water production, the judgment charges WRDSC with the replenishment of the basin. Parties extracting water from the basin pay an assessment to WRDSC on a per acre-foot extracted basis. This assessment is used by WRDSC to purchase replenishment water and to fund other programs for the replenishment and protection of the basin. For more information on WRDSC, go to www.wrd.org. WRDSC publishes a comprehensive Engineers Survey and Report each year, the 66-page report for 2011 is enclosed as an attachment and can also be found at: www.wrd.org/engineering/reports/March4_2011_ESR_Web.pdf

This report goes into great detail regarding groundwater production, groundwater conditions, the quantity and availability and cost of groundwater replenishment, and groundwater projects and programs.

Table 18 - Amount of Groundwater Volume Pumped (AF/Year) *(CWC § 10631(b)(3))* This table shows the annual production from each groundwater basin for the years 2006 through 2010. During 2006 and 2007 the groundwater production was less than the adjudicated rights, and during this period LBWD worked with MWDSC and WRDSC to replenish the groundwater basin through in-lieu means. This was accomplished by MWDSC selling surplus wet-year water to LBWD who, in turn, retired its right to pump its full complement of water rights. The groundwater production was slightly higher than the adjudicated rights during 2008, 2009, and 2010 as LBWD exercised its conjunctive use privileges during these years of drought.

The location and monthly production of each well is identified in the annual Watermaster reports referenced above; this report for 2009-10 identifies 44 wells, 34 of which produced water that year. Eight years of monthly production from the wells is available at the Watermaster's web site: www.water.ca.gov/Watermaster/sd_reports/index.cfm

Table 19 - Amount of Groundwater Projected to be Pumped (AF/Year) *(CWC § 10631(b)(4))* This table shows the expected production from each basin for the years 2015, 2020, 2025, 2030, and 2035. The expected production equals the expected

annual extraction rights. This amount could increase in dry years if MWDSC "calls" its water stored in the conjunctive use account; although technically the extracted water would be MWDSC's water, not LBWD's water. This conjunctive use agreement with MWDSC expires in 2027. The amount extracted could also increase when water shortages require LBWD to extract additional water from storage, as allowed and constrained by the judgment. This amount could also increase if LBWD were to purchase or lease additional water production rights at a cost-effective price from an owner of water production rights. This amount could decrease in wet years when MWDSC and WRDSC both participate in the in-lieu replenishment program, as in the past. LBWD anticipates purchasing or leasing additional rights over the next 25 years, and has projected total rights of 35,000 acre-feet by 2035.

It is not anticipated that production will change as a result of cones of depression, changes in direction and amount of groundwater flow, movement and levels of contaminants, projected average annual recharge, salinity/ total dissolved solids levels or for other factors exclusive of the ones noted above. LBWD has a very long history of successfully operating at this level of production in the Central Basin without developing significant cones of depression or changing the direction and amount of groundwater flow. The portion of the basin used by LBWD is free of contaminants, in large part because that part of the basin is isolated from surface contamination by several layers of impermeable clay. Production is not anticipated to change as a result of average annual recharge because the recharge is managed by WRDSC for the express purpose of maintaining a proper level of recharge and the revenue required to fund this recharge operation will be available because the revenue is generated from a tax on the extraction of the groundwater. Production is not anticipated to be impacted by increased salinity because the source of salinity, namely the Pacific Ocean, is prevented from entering the groundwater basin by an artificial seawater barrier created by WRDSC's barrier injection program.

4.3 Transfer and Exchange *(CWC § 10631(d))*

The UWMP Act encourages water agencies to explore how transfers and/or exchanges would improve the reliability, quality, financial health, or other factors of their water supply. **Table 20 Transfer and Exchange Opportunities** indicates LBWD is not considering transfers and exchange opportunities because its short-term and long-term water supply portfolios are reliable, as explained above, for the next 25 years and the growth in demand for water has remained flat for the last several years and is expected to grow very slowly in the future. Transfers and exchanges are not necessary to improve the quality of groundwater or recycled water; if transfers/ exchanges become necessary to improve the quality of imported water, LBWD will rely on MWDSC to make that determination and pursue the transfers/ exchanges.

4.4 Desalinated Water *(CWC § 10631(i))*

LBWD, in partnership with the U.S. Bureau of Reclamation and the Los Angeles Department of Water and Power, undertook research on the technical, environmental, and financial feasibility of seawater desalination as a source of potable water. The physical research concluded in 2010 and the prototype desalination plant was disassembled. Research on the feasibility and environmental benefits of an under-ocean seawater intake and discharge system, as an alternative to open ocean intake and discharge, continues as of this writing. If and when the decision is made to proceed with a full-time production facility, it is anticipated that:

- It will take from two to four years to permit, design, and construct the facility;
- The plant will produce from 5,000 to 10,000 acre-feet of potable water per year;
- The plant will not utilize a power plant's cooling water as its source water;
- The plant will be located in Long Beach;
- 100% of the product water would be used within the City;
- Demand for imported drinking water will be reduced by an equal amount; and
- The supply of water from the seawater desalination facility will not be impacted by drought conditions.

If the results of this research show that seawater desalination can be technologically, environmentally and economically feasible in Long Beach, a project will likely go forward in the next 10-15 years.

4.5 Recycled Water *(CWC § 10633)*

Recycled water used in Long Beach is wastewater that has been fully treated by a primary, secondary (biological), and tertiary (filtration) process. The Long Beach Water Reclamation Plant, operated by the Sanitation Districts of Los Angeles County, treats up to 25 million gallons of wastewater each day. This high quality water is suitable for irrigation purposes in accordance with the California Code of Regulations, Title 22, for Disinfected Tertiary Treated Recycled Water, meets all State standards for such reuse, and is environmentally safe.

The constraint to putting more of the reclamation plant's output to beneficial municipal and industrial (M&I) use is the high cost of extending the recycled water distribution system to new customers. The existing recycled water distribution system would not have been possible without the generous and significant financial support from the U.S. Bureau of Reclamation and DWR.

Responsibility for planning for the future use and distribution of recycled water in the City of Long Beach falls under LBWD. In 2010, LBWD completed a Recycled Water Master Plan (RWMP). This plan identifies potential recycled water customers and the required recycled water infrastructure to meet future demands. When developing the RWMP plan, LBWD considered the cost of extending different branches of the recycled water distribution system, input from its partners such as WRDSC and other local agencies, and ultimately determined which capital projects were feasible to undertake and when.

Included in the RWMP are possible new projects that would represent new demands on LBWD. For example, the Los Angeles Department of Water and Power's (LADWP) Haynes Generating Station currently uses seawater to cool the electrical generators; within the time period of this 2010 UWMP, the power station will begin phasing out the use of seawater and replace it with large quantities of LBWD's recycled or potable water. And there is the possibility that LBWD may some day provide recycled water to neighboring cities such Signal Hill, Seal Beach and Paramount.

Since its inception many decades ago, the Alamitos Seawater Barrier relied solely on imported drinking water for injection purposes. Approximately 6,000 acre-feet of potable water was injected into the barrier each year. LBWD has also created an innovative partnership with WRDSC to annually inject highly treated recycled water into the seawater barrier, replacing about 1/3rd of the imported drinking water. That project is currently injecting about 2,200 acre-feet annually (2,400 acre-feet in fiscal year 2010) and is expected to reach the full 3,000 acre-feet by 2015

Through continuing conservation efforts and efficient water management, LBWD's GPCD will drop sufficiently by 2035 to ensure 100% reliability even if these planned recycled projects do not materialize as projected in this 2010 UWMP.

Description of Tables Related to this Subsection

Table 21 - Wastewater Collected and Treated (AF/Year) *(CWC § 10633(a))* This table shows the wastewater influent and effluent from the recycled water plant that generates the recycled water put to beneficial use by LBWD. This plant's influent is about 10% greater than its effluent, the difference being sludge which gets transported to the region's sanitary sewer treatment plant. Maximum effluent of the plant is approximately 25 MGD (million gallons per day); but the plant currently operates at a daily average of about 19 MGD. Over the next 25 years the plant may reach capacity. The Long Beach plant is not expected to be enlarged in the future as there is no open space on site in which to expand. All treated water is treated to tertiary standards. This plant services many communities in addition to Long Beach, such as the cities of Lakewood and Cerritos. Only about 10% of the plant's influent is from the City of Long Beach. Much of the wastewater collected from Long Beach is treated in Carson;

the influent streams of the sanitation districts' plants are interconnected, making it possible to divert influent from one plant to another.

Table 22- Disposal of Wastewater (non-recycled) (AF/Year) *(CWC § 10633(b))* This table shows the projections of the amount of recycled water generated and discharged from the Long Beach facility into Coyote Creek. These values are the difference between the effluent of the plant and the recycled water put to beneficial use by LBWD.

Table 23 - Recycled Water Uses - Potential (AF/Year) *(CWC § 10633(d))* This table shows that LBWD expects a significant increase in recycled water delivery over the next 25 years based on the Recycled Water Master Plan. The industrial increase shown is primarily based on commitment from LADWP to use recycled water, in its environmental documentation related to the repower the Haynes Generation Stations. LBWD is therefore planning for increased demand of recycled water over the planning horizon of this 2010 UWMP.

Current uses of Recycled Water in the City of Long Beach include 3,133 acre-feet per year for landscape irrigation, 1,136 acre-feet per year for industrial usage, plus 2,287 acre-feet per year for the seawater barrier injection *(CWC § 10633(c))*, which is also shown on Table 23. The total recycled water used during fiscal year 2010 was 6,556 acre-feet, which equates to about 10% of total water supply.

Table 24 - Recycled Water Uses -- 2005 Use Projection compared to 2010 Actuals (AF/Year) *(CWC § 10633(e))* This table shows that recycled water use in 2010 fell short of that estimated in the 2005 UWMP. The discrepancy is based on the fact that the expansion of additional infrastructure for landscape and industrial use did not meet the original 2005 projections.

Table 25 - Methods to Encourage Recycled Water Use *(CWC § 10633(f))* This table shows the increase in use of recycled water over the next 25 years. This increase results from three major causes: a financial incentive in the form of recycled water rates being as low as 50% of potable water rates; cooperation between WRDSC and LBWD in the planning, construction, and operation of the seawater barrier injection plant; and the expansion of the recycled water distribution system within LBWD service area. This table assumes one-half of the increase in use of recycled water, excluding the water to be used at the seawater barrier, results from the financial incentives and one-half from expansion of the recycled water system.

(CWC § 10633(g)) The 2010 Recycled Water Master Plan is included as an attachment and is available at the following website:
http://www.lbwater.org/pdf/uwmp/recycled_water_master_plan.pdf

4.6 Future Water Projects *(CWC § 10631(g))*

Table 26 - Future Water Supply Projects shows the planned water supply projects and programs that may be undertaken by LBWD, as identified in its water supply and demand assessment. The following describes those projects. *(CWC § 10631(h))*

Expanded Recycled Water Infrastructure

LBWD has a very successful recycled water program, utilizing the water for irrigation and for two very innovative programs: the use of recycled water for subsidence mitigation and for seawater barrier injection.

Although LBWD has access to recycled water, it currently lacks the distribution system needed to bring recycled water to all potential users within the City of Long Beach. Expanding the recycled water system is expensive, in part, because the City of Long Beach is a built-out, older community (Long Beach was incorporated more than 100 years ago). For example, trenching for new pipelines must take into consideration 100 years of previous pipeline installations, including pipelines for sanitary sewer systems, potable water systems, oil production and natural gas distribution. This construction must also consider other factors which can drive up the cost of the project such as soil contamination and previous street construction (some Long Beach streets are made of 18 inches of steel reinforced concrete, for example) and long abandoned and buried railway lines. Nevertheless, LBWD expects to continue to expand its recycled water system in order to make recycled water available to additional customers.

The supply of recycled water is not affected by single or multi-year droughts. The effluent of the recycled water plant exceeds the current or projected use of recycled water; so even drought conditions should not impact LBWD's ability to meet demand.

Recycled Water Barrier Injection Improvement

Imported drinking water has been injected into a seawater barrier in southeast Long Beach for several decades. The barrier prevents the seawater from intruding into the fresh-water aquifers.

WRDSC, in partnership with LBWD and with funding, in part, from the U.S. Bureau of Reclamation, has constructed and now operates a facility to treat recycled water using reverse osmosis and ultraviolet light. The plant uses recycled water from LBWD, provides additional treatment, and provides the highly treated water to Los Angeles County Flood Control District (LACFCD; operator of the barrier) for injection into the seawater barrier. The highly treated recycled water first became available for barrier injection in October 2005 and approximately one-third of the water injected into the barrier is now recycled water, reducing the need for imported drinking water per year.

When the plant is working at full capacity, approximately 3,000 acre-feet of recycled water will be injected each year.

Production of recycled water for the seawater barrier is drought-proof; that is, the production is expected to continue unimpeded even during multiple, consecutive dry-year events.

Seawater Desalination *(CWC § 10631(i))*

See “Desalinated Water Opportunities”, above.

Section 5. Water Supply Reliability and Water Shortage Contingency Planning

5.1 Water Supply Reliability *(CWC § 10631(c)(1) and 10635(a))*

The major sources of water for LBWD are water purchased wholesale from MWDSC, groundwater pumped and treated by LBWD, recycled water and, possibly in the future, desalinated seawater. Each of these supplies is very reliable.

Wholesale Purchases Reliability

LBWD relies on the regional wholesale water agency, MWDSC, for its supplemental water supplies. MWDSC provides about 40% of the potable water consumed in Long Beach. These supplies are imported from the San Francisco/ Sacramento Delta region through the State Water Project and from the Colorado River through the Colorado River Aqueduct.

MWDSC's declaration of reliability: In it's 2010 Regional UWMP, MWDSC states:

> "Metropolitan has supply capabilities that would be sufficient to meet expected demands from 2015 through 2035 under the single dry-year and multiple dry-year conditions, as presented in Figure ES-1". (page ES-5)

Please see the following chart "Figure ES-1" (from MWDSC's Regional UWMP) for an illustration of these points. This declaration of sufficiency assumes the following (page ES-6):

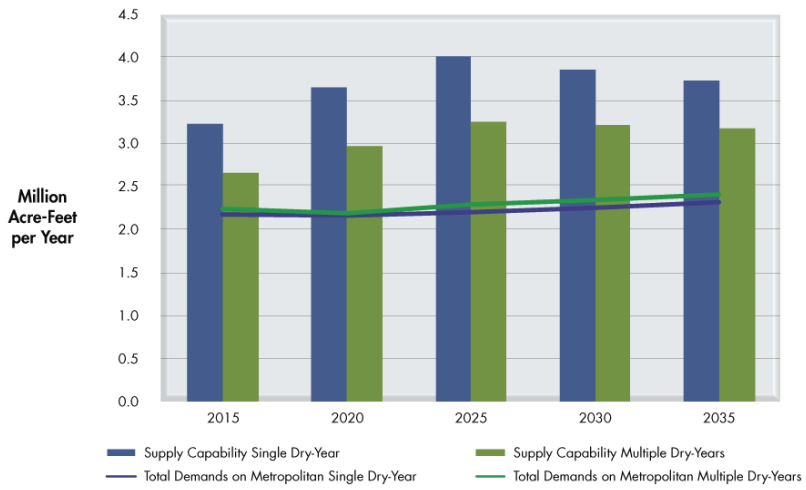
> 1. Supply capabilities are derived using simulated median storage levels going into each of five-year increments based on the balances of supplies and demands. Under the median storage condition, there is an estimated 50 percent probability that storage levels would be higher than the assumption used, and a 50 percent probability that storage levels would be lower than the assumption used.
>
> 2. Under some conditions, Metropolitan may choose to implement the WSAP in order to preserve storage reserves for a future year, instead of using the full supply capability. This can result in impacts at the retail level even under conditions where there may be adequate supply capabilities to meet firm demands.
>
> 3. All storage capability figures shown in the 2010 RUWMP reflect actual storage program conveyance constraints.

The first caveat assumes median storage levels going into each five-year period, but acknowledges there is only a 50% chance that storage levels would be that high; meaning that 50% of the time there will be less than median storage levels. Avoiding shortages will prove more difficult for MWDSC when storage at the onset of dry periods is less than median levels.

With respect to the second caveat, MWDSC seems to anticipate the potential need to impose slightly diminished retail reliability for the sake of minimizing chances for more significant reductions in reliability.

Finally, the main reason MWD suffered the unexpected supply shortage had to do, not with hydrology, but with "regulatory shortage". The future regulatory actions, while highly unpredictable, may have huge impacts on the reliability of MWD's supplies.

Figure ES-1 Supply Capabilities under Single Dry-Year and Multiple Dry-Year Hydrologies



MWDSC's commitment to 100 GPCD: MWDSC incorporated its Water Surplus and Drought Management (or WSDM) Plan in its 2010 Regional UWMP. This WSDM Plan articulates different stages of shortages and different actions based on those stages. However, the 'shortages' envisioned in the plan have more to do with years in which normal imported deliveries are less than demand on MWDSC; these 'shortages' do not necessarily lead to an allocation of water but may be mitigated by drawing down stored water, curtailing interruptible deliveries, acquiring additional supplies from, for example, the spot market, and by taking similar types of actions.

A shortage that results in allocation of M&I supplies (municipal and industrial) is called an Extreme Shortage by MWDSC. It is MWDSC's objective to avoid an Extreme Shortage. Although MWDSC had anticipated in its 2005 Regional UWMP that it was 100% reliable, it unfortunately was forced to declare an Extreme Shortage during the 2007-2011 period and allocate water accordingly.

When MWDSC enters an Extreme Shortage, it intends to develop an allocation plan at that time, a plan based on its board-adopted allocation principles. One of those principles is that MWDSC will guarantee an amount of water necessary for its member agencies to provide a minimum of 100 GPCD to their service areas.

Because LBWD's service area is currently very close to 100 GPCD and it expects to reduce demand to 100 GPCD even during normal years, this guarantee by MWDSC essentially is a guarantee of 100% reliability for LBWD.

LBWD's Preferential Rights to MWDSC supplies: Although MWDSC has adopted its WSDM Plan allocation, state law requires water be allocated according to preferential rights except in extreme conditions.

State law envisions two phases of supply shortages. The first phase requires MWDSC to allocate water based on Preferential Rights; the second, very extreme shortages, allows MWDSC's board to allocate water as it deems best. The California Water Code Section 350, states that MWDSC must allocate water according to Preferential Rights except under the most dire conditions:

> Section 350. The governing body of a distributor of a public water supply, whether publicly or privately owned and including a mutual water company, may declare a water shortage emergency condition to prevail within the area served by such distributor whenever it finds and determines that the ordinary demands and requirements of water consumers cannot be satisfied without depleting the water supply of the distributor to the extent that *there would be insufficient water for human consumption, sanitation, and fire protection*. (Emphasis added).

The above describes the second phase of the extreme water shortage emergency. Section 135, of the Metropolitan Water District Act describes how water will be allocated in the absence of a Section 350 shortage:

> "[e]ach member public agency shall have a preferential right to purchase from [MWDSC] … a portion of the water served by [MWDSC] which shall from time to time bear the same ratio to all of the water supply of [MWDSC] as the total accumulation of amounts paid by such agency to [MWDSC] on tax assessments and otherwise, excepting purchase of water, toward the capital costs and operating expenses of [MWDSC's] works shall bear to the total payments received by [MWDSC] on account of taxes, assessments and otherwise, excepting purchase of water, toward such capital cost and operating expense."

The trigger for allocating water through means other than Preferential Rights is extreme: "…*insufficient water for human consumption, sanitation, and fire protection*." This means MWDSC's water must be allocated according to Preferential Rights up to the point when there is no more water for any landscape irrigation, agriculture or CII use. It's reasonable to assume this means that Preferential Rights may be set aside only after water use for CII, agriculture and similar uses has been prohibited.

The standard for indoor water use as adopted through the SBx7-7 process is 55 GPCD. There are about 19 million people in MWDSC's service area. So one way of thinking about when MWDSC would be able to abandon Preferential Rights (*a condition of insufficient water for human consumption, sanitation, and fire protection)* as an allocation method would be after water use for CII, agriculture, and landscape

and similar uses has been prohibited and the region's entire annual potable supply (this includes MWDSC and local supplies) dropped below roughly 1.2 million acre-feet per year (19 million people x 55 GPCD). Of course, local supplies are not distributed evenly across MWDSC's service area, but for illustrative purposes, MWDSC could be completely without water and the standard of 55 GPCD could still be met.

MWDSC has validated LBWD's preferential rights on many occasions, including the two correspondences shown in Attachment J.

MWDSC recalculates each of its member agency's preferential rights on an annual basis. Preferential rights are expressed as a percent of MWDSC's water. LBWD currently has a preferential right to about 2.54% of MWDSC supplies. For example, as shown in the following table, LBWD has a preferential right to receive approximately 38,100 acre-feet of MWDSC water even when the latter only has 1,500,000 acre-feet of supplies:

LBWD's approx Preferential Rights as a Percent of MWDSC's Imported Water^	2.54%	
MWDSC Supplies *	1,500,000	af / year
LBWD's Preferential Rights	38,100	af / year

^ From MWDSC's 2010 RUWMP, Table 3, page A.4-13

** MWDSC dry-year supplies would include imported water, stored water, water purchased on the spot market, etc.*

LBWD's average annual demand on MWDSC is now about 23,000 acre-feet, which equals only 60% of LBWD's preferential right to MWDSC supplies when the latter has as little as 1.5 million acre-feet.

LBWD requested and MWDSC provided (in a letter dated May 13, 2010; see Attachment J) a discussion of Preferential Rights. The letter reaffirms LBWD's Preferential Rights, stating:

> *"Section 135 of the Metropolitan Water District Act does not relate to pricing but to amounts of water that can be purchased for domestic and municipal uses within a member agency service area. As such, any member agency is permitted to purchase supplies consistent with the Metropolitan Water District Act, including Section 135." (page 3).*

Because MWDSC's future water supplies are fairly reliable as documented in its 2010 Regional UWMP and discussed above, because MWDSC's current allocation plan guarantees an amount of water very near LBWD's need for water (100 GPCD), and

because LBWD has a preferential right to MWDSC's supplies in excess of its need for that water, these wholesale supplies are very reliable.

Groundwater Reliability

LBWD groundwater supply is extracted from the Central Basin Aquifer. As noted above, both extractions from this basin are limited by the Superior Court adjudication and adequate replenishment is guaranteed.

There are several programs to keep the basin replenished, which include the following:

- In-lieu replenishment takes place when those with extraction rights forgo their right to pump certain quantities of water in a given year in exchange for some other benefit, usually some sort of financial recognition.
- Recycled water has been mixed with imported water and/or natural runoff and allowed to percolate into the groundwater basin for many decades. As with most other recycled water, this supply is reliable even during fluctuations in weather, including multiple dry years.
- To the extent possible, San Gabriel River stream flows are used for replenishing the groundwater basin. The quantity of water from this source fluctuates with changes in weather patterns.
- The Long Beach Judgment ensures that actual or replacement flows within and below the San Gabriel River, used for replenishment of the Central Basin Aquifer, continue to meet historic averages or that replacement water is provided. On a long-term basis this flow is required, by the judgment, to meet fixed minimum benchmarks.
- MWDSC's imported replenishment water is purchased for replenishment. Depending on the existing policy of MWDSC's board at that time, the replenishment water may be available at a discount rate or at the full price.

Because sufficient storage is maintained in the Central Basin, because extractions are strictly limited, and because multiple forms of replenishment exist, groundwater supplies from the aquifer are very reliable, even during multi-year droughts.

Recycled Water Reliability

The supply of recycled water is not affected by single or multi-year droughts. The production of the recycled water plant exceeds the current and projected use of recycled water; so even drought conditions should not impact LBWD's ability to meet demand.

Seawater Desalination Reliability

If LBWD elects to develop and put into production a seawater desalination plant, the availability of that water would not be affected by drought conditions (because the raw water would be seawater). The water produced by the plant will be offset by an equal reduction in purchased water from MWDSC.

If the desalination facility is not put into production LBWD will continue to purchase the same amount of water from MWDSC. This will have no impact on MWDSC's ability to supply reliable water to LBWD, due to the relatively minuscule amount of water involved compared to the total MWDSC supply, and for the reasons stated above, in the discussion of imported water.

Conservation Reliability

Implementing the conservation plan as discussed previously will increase the City's water reliability. The key conservation programs envisioned will produce very reliable supplies, even in multi-year droughts. For example, one program is to convert grass lawns into California-friendly landscapes; the only way that "supply" would be unreliable is if the program generated no landscape conversions or at some point people that made the conversions switched back to grass lawns. Both of those scenarios are extremely unlikely. The same holds true for programs like automated meter reading. Once smart meters are installed, additional conservation will take place even during years of normal hydrology, but the smart meters have the added benefit of generating additional conservation during shortages; that is, their "reliability" as a supply will increase during droughts and shortages.

Description of Tables Related to this Subsection

Table 27 – Basis of Water Year Data This table indentifies the specific years that meet the criteria for average, single-dry, and multiple-dry water years for the purpose of this 2010 UWMP,

Table 28 – Supply Reliability – Historic conditions (AF/Year) This table shows each of the multiple dry years indicated in Table 27, compared to and as a percentage of the "average/normal" year.

Table 29 – Factors Resulting in Inconsistency of Supply – *(CWC § 10631(c)(2))* This table shows the factors that may result in inconsistency of supply, as discussed in the preceding paragraphs.

Table 30 – Current & Projected Water Supply Changes Due to Water Quality - % *(CWC § 10634)* Water quality is not anticipated to affect water management strategies or supply reliability any more or less than it currently does, for each of the existing sources of water, through the year 2035. As shown in Table 30, water quality of

recycled water is not expected to change, the water quality of groundwater is not expected to change, and the water quality of water purchased wholesale is not expected to change.

Table 31 Supply Reliability – current water sources *(CWC § 10631(b))* This table compares normal water-year supply and demand. These tables show that normal demands from 2011 through 2014 can be expected to be met with projected supplies. As discussed below, wholesale, groundwater, and recycled water are all highly reliable supplies within the scope of the 2010 UWMP. *(CWC § 10632(b))*

For the purpose of these tables, demand is assumed to be unchanged from "normal" years because not only is there no evidence that demand jumps up during dry years but demand could go down as a result of increased awareness of the need to conserve, particularly during multiple dry-years, as was the case in the early 1990's and during the shortage that just recently ended (approximately summer of 2007 to the spring of 2011). For these reasons, for the purpose of this analysis, it is assumed that dry-year demand is the same as normal demand.

Table 32 - Projected Normal Water Year Supply and Demand (AF/Year) *(CWC § 10631(c)(1))* This table shows the increase in demand in subsequent normal water years in comparison to 2010.

Table 33 Projected Single Dry-year Supply and Demand Comparison *(CWC § 10631(c)(1))* This table projects and compares single dry-year supply and demand for the years 2010, 2015, 2020, 2025, 2030, and 2035. As shown in Table 11 and Table 16, and in the discussions about these tables, supply is expected to meet demand for water in single dry-year scenarios.

Table 34 - Supply & Demand Comparison During Multiple Dry-year Events (AF/Year) *(CWC § 10631(c)(1))* This table projects and compares multiple dry-year supply and demand for the years 2010, 2015, 2020, 2025, 2030, and 2035. Supply is expected to meet demand even in multiple dry-year events, as shown in Table 11 and Table 16, and in the discussions related to these tables and topics.

5.2 Water Shortage Contingency Plan and Drought Planning

The issue of water shortages for LBWD revolves around the reliability of the water purchased wholesale from MWDSC. But as discussed above, even these supplies as they pertain to LBWD are very reliable. LBWD's other supplies are very reliable; those supplies being recycled water, groundwater, conservation and, potentially, seawater desalinated seawater.

Recycled water is very reliable because the production of recycled water will not decrease significantly in drought conditions and because the recycled water plant

produces water significantly in excess of demand (that is, even with a slight decrease in production, the plant's production will still significantly exceed demand).

Groundwater is very reliable because production of groundwater from the Central Basin aquifer, the source of LBWD groundwater, is not dependent on favorable single-year or multi-year hydrology. Extractions from the groundwater basin are limited as a result of the basin's adjudication; while the storage capacity of the basin greatly exceeds the annual extraction rights (see the attached documents addressing groundwater management and the adjudication for more detailed information on capacity, storage, and actual extractions and extraction rights).

Seawater desalination, if developed in Long Beach, will be very reliable because it will not depend on hydrology. Therefore, its production will not be impacted by drought-induced shortages.

Description of Tables Related to this Subsection

Table 35 – Water Supply Shortage contingency – rationing stages to address water supply shortages (*CWC § 10632(a))* This table shows LBWD's thresholds for implementation of various actions to support water conservation, indicating retail water supply conditions in Long Beach during several phases of a shortage at the retail level.

The supply conditions and approximate percent retail shortages shown are for illustration only. Causes, severity, duration and timing of extreme shortages are unpredictable; therefore, the Board reserves the discretion to move from one phase of a shortage to another and to impose greater or lesser disruptions of retail supplies as events inform its judgment. Additionally, the Board may choose to declare a certain shortage stage prior to the actual water-supply shortfall for the purpose of preserving limited local and regional supplies and storage for an uncertain future. The actions to be taken by LBWD within each phase are prescribed in the Board-adopted resolution describing actions to be taken during a water supply shortage. A copy of this resolution is attached. *(CWC § 10632(h))*

Because LBWD's groundwater, recycled water and conserved water are reliable, the condition that would force LBWD into a shortage would likely be the wholesale supplier's inability to meet LBWD's demand for supplemental water. As discussed elsewhere in this 2010 UWMP, the whole agencies deliveries to LBWD would have to reflect many factors including preferential rights and LBWD's low GPCD.

MWDSC referenced and summarized its WSDM Plan in its 2010 Regional UWMP. This plan and MWDSC's shortage allocation were discussed in subsection 5.1, Wholesale Purchases Reliability, above.

Table 36 – Water Shortage Contingency – Mandatory Prohibitions *(CWC § 10632(d))* LBWD's water conservation and water supply shortage plan, attached, lists the prohibitions against specific water uses both when water supplies are sufficient to meet normal demands, as well as prohibitions when water supplies are less than normal demands. Table 36 summarizes these prohibitions. These include prohibitions against excessive irrigation run-off, cleaning paved surfaces with potable water, failure to repair leaks, surface irrigation during restricted hours, and so on.

In September 2007, LBWD declared an "Imminent Water Supply Shortage" condition, which triggered additional prohibitions beyond the permanent restrictions already in place. A Declaration of an Imminent Water Supply Shortage was necessitated by the profound impact of a U.S. District Court's federal Endangered Species Act ruling, substantial reductions in water storage levels in key reservoirs in northern California, multiple years of record low rainfall in the southern California coastal plain, and a continuation of the historic eleven-year drought in the Colorado River Watershed, which is a significant source of imported water for southern California. Approximately 40% of the City's water supply is imported.

Table 37 – Water Shortage Contingency – Consumption Reduction Methods *(CWC § 10632(e))* This table provides a list of consumption reduction methods LBWD will use to reduce water use in the most restrictive stages with up to a 50% reduction. In addition to the restrictions listed in Table 36 LBWD:

- Will increase public education,
- Will increase the kinds of water uses that are prohibited,
- Will increase the water use charge imposed when in violation of a prohibition, and
- May increase water rates.

For detailed information please find the attached water conservation and water supply shortage plan.

Table 38 - Water Shortage Contingency - Penalties and Charges *(CWC § 10632(f))* This table shows the penalties and charges for excessive-use. These include the following: water-use charges for violation of prohibited uses of water restrictions, which increase with every warning and with the severity of the shortage. LBWD also imposes tiered water rates on residential accounts; the price of the water in the different tiers increases with the severity of the shortage. LBWD also reserves the right to install flow restrictors or terminate water service after repeated violations.

Catastrophic Supply Interruption Plan *(CWC § 10632(c))*

Given the critical nature of the services provided by LBWD to public health, and recent security considerations, emergency conditions and responses are no longer explored

in public forums such as the 2010 UWMP or the actions to be taken by LBWD to mitigate the impacts of emergency and catastrophic events. LBWD completed a confidential, comprehensive study of its vulnerabilities; a study that was developed in cooperation with federal authorities, regional and local first-responders, and other experts; and has completed the necessary measures to mitigate the impacts of catastrophic events. Therefore, it would be inappropriate to describe events and potential impacts on LBWD's ability to successfully perform its essential services, and LBWD's potential responses to these events.

In the event that it could not meet 100% of the City's demand for water, LBWD would declare a water emergency and take appropriate actions as outlined in its water conservation and water supply shortage plan.

LBWD's water conservation and water supply shortage plan is attached and lists the mandatory prohibitions against specific water use practices during water shortages associated with the various phases of an emergency.

Impact on Revenue of Reduced Sales During Shortages *(CWC § 10632(g))*

Determining the actual impact prior to the event is very difficult, given the number and unpredictable nature of the variables involved. However, in general terms it is likely that the change in net revenue and the change in net expenses will be roughly equal. Revenues will be supported by expected rate increases while expenses for imported drinking water (the greatest single line item in LBWD's budget) will decrease. Furthermore, staff will likely be pulled from high-cost capital projects, delaying high capital equipment expenditures, while additional expenses will be incurred in the form of extraordinary water conservation actions.

In an extreme shortage when the demand for water is cut by 50%, essentially all costs associated with wholesale purchases would be eliminated. These purchases represent about 25% of LBWD budget. Also, in a severe shortage a rate increase could be implemented to encourage water conservation; however, with the reduction in costs, the rate increase would have to be managed so as not to generate an amount of revenue greatly in excess of LBWD's revenue requirements. The combination of slightly higher rates and a dramatic reduction in costs would compensate for the lost sales.

In the event of a funding shortfall resulting from an extreme shortage, LBWD would have the option of reducing expenses by postponing certain capital projects and re-directing staff to emergency conservation efforts.

As a prudent agency providing an essential public service, LBWD maintains a minimum fund balance for use in emergencies. In the unlikely event LBWD is hurt financially by an extreme shortage, these reserves could be utilized.

The increase in staffing costs would be minor, if any. Staff could be redirected from their normal duties to the emergency work that needs be done. After the emergency, the staff would be refocused on their "normal" capital project duties. There could be a reduction in expenses for normal operations and maintenance activities if staff performing those functions are redirected to conservation; those savings could be off-set by increased conservation-related projects such as the distribution of certain water conserving devices. The cost of wholesale water, on a per acre-foot basis, could be expected to increase, but not dramatically. This is the same water that LBWD would be acquiring less of during the most likely shortages. The cost of pumping and treating groundwater would not change significantly, if at all.

With the reduction in sales comes a significant reduction in the money spent for costly imported drinking water and a compensating increase in the water rate to encourage additional conservation. Additionally, because staff will likely be pulled, temporarily at least, from high-capital-cost activities such as capital improvement projects, staffing costs will not increase but capital equipment costs will decrease. For these reasons, the effect of a shortage on expenditures will be minimal.

Water Use Monitoring Mechanisms *(CWC § 10632(i))* If the circumstances warranted close monitoring of demand for determining water-demand reductions, LBWD is able to monitor groundwater production and the purchase of wholesale water using systems that electronically collect and store information. That is, demand reduction could be monitored by closely tracking the quantity of water put into the distribution system.

Section 6. Demand Management Measures

UWMP Guidebook, page E-1, states:

> *"DMMs are specific actions a water supplier takes to support its water conservation efforts. Specifically, the UWMP Act identifies 14 DMMs (CWC § 10631(f)) that are to be evaluated in each UWMP…*
>
> *… DWR has …determined that DMMs will be equated with the BMPs as described in the CUWCC MOU for loan and grant funding eligibility purposes. Therefore, for the UWMP process, DMMs, and BMPs are referred to interchangeably as DMMs/BMPs."*

UWMP Guidebook goes on to state (page E-3):

> *"An urban water supplier's UWMP is to document its DMM implementation by either:*
>
> - *Providing the required information for each DMM*
> - *Submitting a copy of its 2009-2010 approved CUWCC BMP report, if the supplier is a signatory to the CUWCC MOU"*

LBWD is a signatory of the CUWCC MOU and has submitted its 2009-2010 BMP reports to the CUWCC; a copy of those reports is included with this 2010 UWMP (Attachment G).

CUWCC evaluated LBWD's BMP submittals and has found LBWD to be 100% "on track" to meeting the BMP coverage requirements (this finding is often referred to "being in compliance" with the BMPs or "approved" by the CUWCC). A copy of the CUWCC coverage report is included in this 2010 UWMP as Attachment K.

LBWD submitted, through the BMP reporting process, detailed reports on its sources and uses of potable and recycled water for the years 2009 and 2010.

LBWD has met the coverage requirements of the foundational BMPs. LBWD submitted Foundational BMP 1.1 Operations Practices for both 2009 and 2010, documenting the water waste prevention regulations. LBWD's Foundational BMP 1.2 Water Loss reports for both 2009 and 2010 include LBWD's water audit validity score for 2010 and report on water loss performance, and LBWD submitted a completed American Water Works Association (AWWA) water loss spreadsheet. LBWD's Foundational BMP 1.3 Metering with Commodity Rates reports for both 2009 and 2010 show the number of accounts whose meters are read and the number of meters not read. LBWD also submitted a study considering the feasibility of switching mixed-use CII meters to mixed-use plus dedicated irrigation meters. LBWD's Foundational BMP 1.4 Retail Conservation Pricing reports for both 2009 and 2010 comparing total revenue from volumetric charges and daily service fees by customer class. LBWD's

Foundational BMP 2.1 and 2.2 Public Outreach and School Education, respectively, for both 2009 and 2010, documenting the activities, budget and expenses of these undertakings.

LBWD has met the coverage requirements of the programmatic BMPs. LBWD met the coverage requirements by meeting the GPCD reduction target for the year 2010. The target was 128 GPCD; actual water use was 110 GPCD.

LBWD has maintained an excellent water conservation program for many years. In the past the program essentially revolved around incentivizing the installation of water efficient devices. For example, LBWD had toilet exchange and toilet rebate programs for many years. The current rebate programs include special programs for residential customers and for non-residential customers. The former program includes rebates for devices such as water-efficient clothes washers and landscape irrigation equipment. The latter includes a range of devices suited for use in typical non-residential settings (such as toilets and landscape irrigation equipment), as well as specialized devices such as those found in cooling towers, restaurants, and even dental offices.

Looking into the future, the major shift in LBWD's conservation program will be one of customer awareness of the amount and cost of the water they use and the importance of conservation, and an effort to transition Long Beach from grass lawns to drought tolerant landscapes.

One of the on-going programs has always been going to schools to help teachers and students understand the importance of water conservation. LBWD has also had for many years, a very strong program of public education. In recent years, LBWD dramatically increased these programs as the water shortage loomed. LBWD expects to continue to implement these programs well into the future.

Section 7. Climate Change

The effects that climate change will have on water supply and demand are unknown at this time, given the uncertainty with respect to local impacts, intensity, duration and timeliness. Whether severe droughts are cyclical and part of a normal pattern or an early sign of climate change is unclear at this time.

LBWD does not expect climate change to have a major impact on its local sources of water, such as groundwater and recycled water, during the time projections of this 2010 UWMP. Climate change effects on LBWD's wholesale purchases have been addressed in MWDSC's 2010 Regional UWMP.

Section 8. Completed UWMP Checklist

The following pages show the completed UWMP checklist confirming that the required elements have been included in this 2010 UWMP and indicating location information within this document. The tables referenced in the right-most column of the checklist refer to tables in Attachment B.

Table I-1 Urban Water Management Plan checklist, organized by legislation number

	UWMP requirement	Calif. Water Code	Subject	Additional clarification	UWMP location
1	Provide baseline daily per capita water use, urban water use target, interim urban water use target, and compliance daily per capita water use, along with the bases for determining those estimates, including references to supporting data.	10608.20(e)	System Demands		Sec. 3.2 (pg 22)
2	*Wholesalers:* Include an assessment of present and proposed future measures, programs, and policies to help achieve the water use reductions. *Retailers:* Conduct at least one public hearing that includes general discussion of the urban retail water supplier's implementation plan for complying with the Water Conservation Bill of 2009.	10608.36 10608.26(a)	System Demands	Retailer and wholesalers have slightly different requirements	Sec. 1.1 (pg 13); and Sec. 3.3 (pg 29)
3	Report progress in meeting urban water use targets using the standardized form.	10608.40	Not applicable	Standardized form not yet available	NA
4	Each urban water supplier shall coordinate the preparation of its plan with other appropriate agencies in the area, including other water suppliers that share a common source, water management agencies, and relevant public agencies, to the extent practicable.	10620(d)(2)	Plan Preparation		Exec. Summ. (pg 10); Sec. 1.1 (pg 13); and Table 1
5	An urban water supplier shall describe in the plan water management tools and options used by that entity that will maximize resources and minimize the need to import water from other regions.	10620(f)	Water Supply Reliability . . .		Sec. 3.4 (beginning pg 30); Sec. 4.4 (pg 36); Sec. 4.5 (pg 36); and Sec. 4.6 (pg 39)
6	Every urban water supplier required to prepare a plan pursuant to this part shall, at least 60 days prior to the public hearing on the plan required by Section 10642, notify any city or county within which the supplier provides water supplies that the urban water supplier will be reviewing the plan and considering amendments or changes to the plan. The urban water supplier may consult with, and obtain comments from, any city or county that receives notice pursuant to this subdivision.	10621(b)	Plan Preparation		Sec. 1 (pg 13); and Table 1
7	The amendments to, or changes in, the plan shall be adopted and filed in the manner set forth in Article 3 (commencing with Section 10640).	10621(c)	Plan Preparation		Sec. 1.2 (pg 13)

	UWMP requirement	Calif. Water Code	Subject	Additional clarification	UWMP location
8	Describe the service area of the supplier	10631(a)	System Description		Sec. 2 (begin pg 15)
9	(Describe the service area) climate	10631(a)	System Description		Sec. 2.2 (pgs 15-17)
10	(Describe the service area) current and projected population . . . The projected population estimates shall be based upon data from the state, regional, or local service agency population projections within the service area of the urban water supplier . . .	10631(a)	System Description	Provide the most recent population data possible. Use the method described in "Baseline Daily Per Capita Water Use." See Section M.	Sec. 2.3 (pg 17)
11	. . . (population projections) shall be in five-year increments to 20 years or as far as data is available.	10631(a)	System Description	2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Sec. 2.3 (pg 17); and Table 2
12	Describe . . . other demographic factors affecting the supplier's water management planning	10631(a)	System Description		Sec. 2.4 (begin pg 17)
13	Identify and quantify, to the extent practicable, the existing and planned sources of water available to the supplier over the same five-year increments described in subdivision (a).	10631(b)	System Supplies	The 'existing' water sources should be for the same year as the "current population" in line 10. 2035 and 2040 can also be provided to support consistency with Water Supply Assessments and Written Verification of Water Supply documents.	Sec. 4 (begin pg 33); and Tables 16-19

	UWMP requirement	Calif. Water Code	Subject	Additional clarification	UWMP location
14	(Is) groundwater . . . identified as an existing or planned source of water available to the supplier . . .?	10631(b)	System Supplies	Source classifications are: surface water, groundwater, recycled water, storm water, desalinated sea water, desalinated brackish groundwater, and other.	Sec. 4.2 (pg 33); and Tables 16-19
15	(Provide a) copy of any groundwater management plan adopted by the urban water supplier, including plans adopted pursuant to Part 2.75 (commencing with Section 10750), or any other specific authorization for groundwater management. Indicate whether a groundwater management plan been adopted by the water supplier or if there is any other specific authorization for groundwater management. Include a copy of the plan or authorization.	10631(b)(1)	System Supplies		Sec. 4.2 (pgs 33-35); and Attachment D
16	(Provide a) description of any groundwater basin or basins from which the urban water supplier pumps groundwater.	10631(b)(2)	System Supplies		Sec. 4.2 (pgs 33-35)
17	For those basins for which a court or the board has adjudicated the rights to pump groundwater, (provide) a copy of the order or decree adopted by the court or the board	10631(b)(2)	System Supplies		Sec. 4.2; and Attachment C
18	(Provide) a description of the amount of groundwater the urban water supplier has the legal right to pump under the order or decree.	10631(b)(2)	System Supplies		Sec. 4.2 (pgs 33-35)
19	For basins that have not been adjudicated, (provide) information as to whether the department has identified the basin or basins as overdrafted or has projected that the basin will become overdrafted if present management conditions continue, in the most current official departmental bulletin that characterizes the condition of the groundwater basin, and a detailed description of the efforts being undertaken by the urban water supplier to eliminate the long-term overdraft condition.	10631(b)(2)	System Supplies		NA – basin is adjudicated.

	UWMP requirement	Calif. Water Code	Subject	Additional clarification	UWMP location
20	(Provide a) detailed description and analysis of the location, amount, and sufficiency of groundwater pumped by the urban water supplier for the past five years. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(3)	System Supplies		Sec. 4.2 (pgs 33-35); and Table 18
21	(Provide a) detailed description and analysis of the amount and location of groundwater that is projected to be pumped by the urban water supplier. The description and analysis shall be based on information that is reasonably available, including, but not limited to, historic use records.	10631(b)(4)	System Supplies	Provide projections for 2015, 2020, 2025, and 2030.	Sec. 4.2 (pgs 33-35); and Tables 16-19
22	Describe the reliability of the water supply and vulnerability to seasonal or climatic shortage, to the extent practicable, and provide data for each of the following: (A) An average water year, (B) A single dry water year, (C) Multiple dry water years.	10631(c)(1)	Water Supply Reliability . . .		Sec. 5.1 (begin pg 41); and Tables 32-34
23	For any water source that may not be available at a consistent level of use - given specific legal, environmental, water quality, or climatic factors - describe plans to supplement or replace that source with alternative sources or water demand management measures, to the extent practicable.	10631(c)(2)	Water Supply Reliability . . .		Sec. 5.1 (pgs 41 & 46); and Table 29
24	Describe the opportunities for exchanges or transfers of water on a short-term or long-term basis.	10631(d)	System Supplies		Sec. 4.3 (pg 35); and Table 20
25	Quantify, to the extent records are available, past and current water use, and projected water use (over the same five-year increments described in subdivision (a)), identifying the uses among water use sectors, including, but not necessarily limited to, all of the following uses: (A) Single-family residential; (B) Multifamily; (C) Commercial; (D) Industrial; (E) Institutional and governmental; (F) Landscape; (G) Sales to other agencies; (H) Saline water intrusion barriers, groundwater recharge, or conjunctive use, or any combination thereof;(I) Agricultural.	10631(e)(1)	System Demands	Consider “past” to be 2005, present to be 2010, and projected to be 2015, 2020, 2025, and 2030. Provide numbers for each category for each of these years.	Sec. 3.1 (begin pg 20);and Tables 3-11

	UWMP requirement	Calif. Water Code	Subject	Additional clarification	UWMP location
26	(Describe and provide a schedule of implementation for) each water demand management measure that is currently being implemented, or scheduled for implementation, including the steps necessary to implement any proposed measures, including, but not limited to, all of the following: (A) Water survey programs for single-family residential and multifamily residential customers; (B) Residential plumbing retrofit; (C) System water audits, leak detection, and repair; (D) Metering with commodity rates for all new connections and retrofit of existing connections; (E) Large landscape conservation programs and incentives; (F) High-efficiency washing machine rebate programs; (G) Public information programs; (H) School education programs; (I) Conservation programs for commercial, industrial, and institutional accounts; (J) Wholesale agency programs; (K) Conservation pricing; (L) Water conservation coordinator; (M) Water waste prohibition;(N) Residential ultra-low-flush toilet replacement programs.	10631(f)(1)	DMMs	Discuss each DMM, even if it is not currently or planned for implementation. Provide any appropriate schedules.	Sec. 6 (begin pg 52); and Attachment G
27	A description of the methods, if any, that the supplier will use to evaluate the effectiveness of water demand management measures implemented or described under the plan.	10631(f)(3)	DMMs		Sec. 6 (begin pg 52); and Attachments G and K
28	An estimate, if available, of existing conservation savings on water use within the supplier's service area, and the effect of the savings on the supplier's ability to further reduce demand.	10631(f)(4)	DMMs		Sec. 6 (begin pg 52); and Attachments G and K

	UWMP requirement	Calif. Water Code	Subject	Additional clarification	UWMP location
29	An evaluation of each water demand management measure listed in paragraph (1) of subdivision (f) that is not currently being implemented or scheduled for implementation. In the course of the evaluation, first consideration shall be given to water demand management measures, or combination of measures, that offer lower incremental costs than expanded or additional water supplies. This evaluation shall do all of the following: (1) Take into account economic and noneconomic factors, including environmental, social, health, customer impact, and technological factors; (2) Include a cost-benefit analysis, identifying total benefits and total costs; (3) Include a description of funding available to implement any planned water supply project that would provide water at a higher unit cost; (4) Include a description of the water supplier's legal authority to implement the measure and efforts to work with other relevant agencies to ensure the implementation of the measure and to share the cost of implementation.	10631(g)	DMMs	See 10631(g) for additional wording.	Sec. 6 (begin pg 52); and Attachments G and K
30	(Describe) all water supply projects and water supply programs that may be undertaken by the urban water supplier to meet the total projected water use as established pursuant to subdivision (a) of Section 10635. The urban water supplier shall include a detailed description of expected future projects and programs, other than the demand management programs identified pursuant to paragraph (1) of subdivision (f), that the urban water supplier may implement to increase the amount of the water supply available to the urban water supplier in average, single-dry, and multiple-dry water years. The description shall identify specific projects and include a description of the increase in water supply that is expected to be available from each project. The description shall include an estimate with regard to the implementation timeline for each project or program.	10631(h)	System Supplies		Sec. 4.6 (begin pg 39); and Table 26

31	Describe the opportunities for development of desalinated water, including, but not limited to, ocean water, brackish water, and groundwater, as a long-term supply.	10631(i)	System Supplies		Sec. 4.4 (pg 36)
32	Include the annual reports submitted to meet the Section 6.2 requirement (of the MOU), if a member of the CUWCC and signer of the December 10, 2008 MOU.	10631(j)	DMMs	Signers of the MOU that submit the annual reports are deemed compliant with Items 28 and 29.	Sec 6 (begin pg 52); and Attachments G and K
33	Urban water suppliers that rely upon a wholesale agency for a source of water shall provide the wholesale agency with water use projections from that agency for that source of water in five-year increments to 20 years or as far as data is available. The wholesale agency shall provide information to the urban water supplier for inclusion in the urban water supplier's plan that identifies and quantifies, to the extent practicable, the existing and planned sources of water as required by subdivision (b), available from the wholesale agency to the urban water supplier over the same five-year increments, and during various water-year types in accordance with subdivision (c). An urban water supplier may rely upon water supply information provided by the wholesale agency in fulfilling the plan informational requirements of subdivisions (b) and (c).	10631(k)	System Demands	Average year, single dry year, multiple dry years for 2015, 2020, 2025, and 2030.	Sec. 3.1 (pg 22); and Table 12
34	The water use projections required by Section 10631 shall include projected water use for single-family and multifamily residential housing needed for lower income households, as defined in Section 50079.5 of the Health and Safety Code, as identified in the housing element of any city, county, or city and county in the service area of the supplier.	10631.1(a)	System Demands		Sec. 3.1 (pg 21); and Table 8
35	Stages of action to be undertaken by the urban water supplier in response to water supply shortages, including up to a 50 percent reduction in water supply, and an outline of specific water supply conditions which are applicable to each stage.	10632(a)	Water Supply Reliability . . .		Sec. 5.2 (begin pg 47); and Table 35
36	Provide an estimate of the minimum water supply available during each of the next three water years based on the driest three-year historic sequence for the agency's water supply.	10632(b)	Water Supply Reliability . . .		Sec. (begin pg 46); and Table 31

37	(Identify) actions to be undertaken by the urban water supplier to prepare for, and implement during, a catastrophic interruption of water supplies including, but not limited to, a regional power outage, an earthquake, or other disaster.	10632(c)	Water Supply Reliability . . .	Sec. 5.2 (begin pg 49);
38	(Identify) additional, mandatory prohibitions against specific water use practices during water shortages, including, but not limited to, prohibiting the use of potable water for street cleaning.	10632(d)	Water Supply Reliability . . .	Sec. 5.2 (begin pg 49)
39	(Specify) consumption reduction methods in the most restrictive stages. Each urban water supplier may use any type of consumption reduction methods in its water shortage contingency analysis that would reduce water use, are appropriate for its area, and have the ability to achieve a water use reduction consistent with up to a 50 percent reduction in water supply.	10632(e)	Water Supply Reliability . . .	Sec. 5.2 (begin pg 47; esp. pg 49); and Tables 36-38
40	(Indicated) penalties or charges for excessive use, where applicable.	10632(f)	Water Supply Reliability . . .	Sec. 5.2 (begin pg 47; esp. pg 49); and Table 38
41	An analysis of the impacts of each of the actions and conditions described in subdivisions (a) to (f), inclusive, on the revenues and expenditures of the urban water supplier, and proposed measures to overcome those impacts, such as the development of reserves and rate adjustments.	10632(g)	Water Supply Reliability . . .	Section 5.2 (begin pg 50)
42	(Provide) a draft water shortage contingency resolution or ordinance.	10632(h)	Water Supply Reliability . . .	Sec. 5.2 (pg 47); and Attachment F
43	(Indicate) a mechanism for determining actual reductions in water use pursuant to the urban water shortage contingency analysis.	10632(i)	Water Supply Reliability . . .	Sec. 5.2 (pg 51)
44	Provide, to the extent available, information on recycled water and its potential for use as a water source in the service area of the urban water supplier. The preparation of the plan shall be coordinated with local water, wastewater, groundwater, and planning agencies that operate within the supplier's service area	10633	System Supplies	Sec. 4.5 (pgs 36-38)
45	(Describe) the wastewater collection and treatment systems in the supplier's service area, including a quantification of the amount of wastewater collected and treated and the methods of wastewater disposal.	10633(a)	System Supplies	Sec. 4.5 (pgs 36-38); and Table 21

46	(Describe) the quantity of treated wastewater that meets recycled water standards, is being discharged, and is otherwise available for use in a recycled water project.	10633(b)	System Supplies		Sec. 4.5 (pgs 36-38); and Table 22
47	(Describe) the recycled water currently being used in the supplier's service area, including, but not limited to, the type, place, and quantity of use.	10633(c)	System Supplies		Sec. 4.5 (pgs 36-38); and Table 23
48	(Describe and quantify) the potential uses of recycled water, including, but not limited to, agricultural irrigation, landscape irrigation, wildlife habitat enhancement, wetlands, industrial reuse, groundwater recharge, indirect potable reuse, and other appropriate uses, and a determination with regard to the technical and economic feasibility of serving those uses.	10633(d)	System Supplies		Sec. 4.5 (pgs 36-38); and Table 23
49	(Describe) The projected use of recycled water within the supplier's service area at the end of 5, 10, 15, and 20 years, and a description of the actual use of recycled water in comparison to uses previously projected pursuant to this subdivision.	10633(e)	System Supplies		Sec. 4.5 (pgs 36-38); and Table 24
50	(Describe the) actions, including financial incentives, which may be taken to encourage the use of recycled water, and the projected results of these actions in terms of acre-feet of recycled water used per year.	10633(f)	System Supplies		Sec. 4.5 (pgs 36-38); and Table 25
51	(Provide a) plan for optimizing the use of recycled water in the supplier's service area, including actions to facilitate the installation of dual distribution systems, to promote recirculating uses, to facilitate the increased use of treated wastewater that meets recycled water standards, and to overcome any obstacles to achieving that increased use.	10633(g)	System Supplies		Sec. 4.5 (pgs 36-38); and Attachment I
52	The plan shall include information, to the extent practicable, relating to the quality of existing sources of water available to the supplier over the same five-year increments as described in subdivision (a) of Section 10631, and the manner in which water quality affects water management strategies and supply reliability.	10634	Water Supply Reliability . . .	For years 2010, 2015, 2020, 2025, and 2030	Sec. 5.1 (pg 46); and Table 30

53	Every urban water supplier shall include, as part of its urban water management plan, an assessment of the reliability of its water service to its customers during normal, dry, and multiple dry water years. This water supply and demand assessment shall compare the total water supply sources available to the water supplier with the total projected water use over the next 20 years, in five-year increments, for a normal water year, a single dry water year, and multiple dry water years. The water service reliability assessment shall be based upon the information compiled pursuant to Section 10631, including available data from state, regional, or local agency population projections within the service area of the urban water supplier.	10635(a)	Water Supply Reliability . . .	Sec. 5.1 (begin pg 41); and Tables 32-34
54	The urban water supplier shall provide that portion of its urban water management plan prepared pursuant to this article to any city or county within which it provides water supplies no later than 60 days after the submission of its urban water management plan.	10635(b)	Plan Preparation	Sec. 1.2 (pg 14); and Table 1
55	Each urban water supplier shall encourage the active involvement of diverse social, cultural, and economic elements of the population within the service area prior to and during the preparation of the plan.	10642	Plan Preparation	Exec Summ (pg 10); and Table 1
56	Prior to adopting a plan, the urban water supplier shall make the plan available for public inspection and shall hold a public hearing thereon. Prior to the hearing, notice of the time and place of hearing shall be published within the jurisdiction of the publicly owned water supplier pursuant to Section 6066 of the Government Code. The urban water supplier shall provide notice of the time and place of hearing to any city or county within which the supplier provides water supplies. A privately owned water supplier shall provide an equivalent notice within its service area.	10642	Plan Preparation	Sec 1.1 (pg 13)
57	After the hearing, the plan shall be adopted as prepared or as modified after the hearing.	10642	Plan Preparation	Exec Summ (pg 10)
58	An urban water supplier shall implement its plan adopted pursuant to this chapter in accordance with the schedule set forth in its plan.	10643	Plan Preparation	Sec. 1.2 (pg 14)

59	An urban water supplier shall submit to the department, the California State Library, and any city or county within which the supplier provides water supplies a copy of its plan no later than 30 days after adoption. Copies of amendments or changes to the plans shall be submitted to the department, the California State Library, and any city or county within which the supplier provides water supplies within 30 days after adoption.	10644(a)	Plan Preparation	Sec. 1.2 (pg 14)
60	Not later than 30 days after filing a copy of its plan with the department, the urban water supplier and the department shall make the plan available for public review during normal business hours.	10645	Plan Preparation	Sec. 4.2 (pg 14)

List of Attachments

Most of these attachments are very large documents and can be found on the internet (links are provided below, throughout this document, and on the LBWD website at www.lbwater.org). They are all available for review, by appointment, during normal business hours, at LBWD administration offices, located at 1800 East Wardlow Road. Copies of these attachments, other than the tables referenced in the body of the 2010 UWMP, are only provided with the official, adopted version sent to the California Department of Water Resources. Photocopies of the attachments are available at cost.

A. Board of Water Commissioners resolution adopting *2010 UWMP*

B. Tables 1 through 38, referenced in the body of the UWMP

C. Central Basin Judgment

D. Watermaster's Central Basin Report, FY 2009-10

E. WRDSC's 2011 Engineering Survey and Report

F. LBWD Water Conservation and Water Supply Shortage Plan

G. CUWCC BMP Reports for 2005 through 2010

H. GPCD Compliance Spreadsheet

I. 2010 Recycled Water Master Plan

J. MWD Letter re: Reliability and Preferential Rights

K. CUWCC BMP Retail Coverage Report 2009-2010